

# MARINE REVIEW

VOL. XVIII.

CLEVELAND, O., SEPTEMBER 29, 1898.

No. 12

## Lake Ships for the Atlantic.

THIRTY-FIVE OF THE OLD STYLE OF LAKE CARRIERS UNDER CHARTER—THEY ARE NOW MOVING DOWN THE ST. LAWRENCE—LIST OF THE VESSELS—EXTENSIVE OPERATIONS OF THE ATLANTIC TRANSPORTATION CO.

No event since the advent of the Rockefeller interest in the field of lake transportation has caused anything like the discussion which followed the announcement in the Review, last week, of the plans of the Atlantic Transportation Co. of New York for the transfer to the coast, on charters running from three to five years, of a large number of lake vessels of the older type. The operations of the New York company, represented by its general manager, Walter S. Besse, and acting largely through J. C. Gilchrist of Cleveland, have been on such a big scale that all sorts of questions have been raised regarding their financial standing and the service in which the vessels are to be engaged. The extent of attention given to the subject is by no means strange, however, when the diversity of interests involved and the novelty of the project is taken into consideration. The owners—and they are numerous—of wooden tonnage suited to the trade in which the Atlantic company is engaged, are, of course, directly interested, and added to this is the indirect interest of all other vessel owners, and the ship builders as well, as to the effect on lake commerce that will be produced by the removal of this tonnage to the seaboard.

### THE LIST OF VESSELS.

At noon Thursday it was announced from the office of Mr. Gilchrist that five steamers and thirty barges had been engaged up to that time. Contracts were not fully closed on three of the steamers, and there were a few of the barges also on which negotiations were not fully concluded. Twelve of the vessels had already started for the coast, and it is expected that the entire fleet will have passed down the St. Lawrence before the close of next week. It was also announced by Mr. Besse when the list of thirty barges was made up that only five more would be taken, as there would then be just what was wanted, a fleet of seven barges for each steamer. The list of vessels was not given out but there has been no difficulty in getting the names from owners. The barges are as follows: F. A. Georger, Moonlight, H. D. Alverson, W. S. Crosthwaite, Verona, M. S. Bacon, S. H. Foster, Thomas P. Sheldon, S. L. Watson, Chas. Foster, Halloran, Camden, Brunette, John O'Neil, Charles Wall, H. W. Sage, Iron State, Iron City, Sandiego, Rediving, S. V. R. Watson, Annie M. Ash, Wadena, Becker, Thos. L. Parker, M. W. Page, David Wallace, Massasoit. The first ten vessels in the foregoing list are those of the Gilchrist fleet. The list is too short of the total of thirty reported chartered. Of the five steamers only two, as far as could be learned, were definitely placed. These were the Aragon and Lindsey, which were chartered by C. R. Jones, who also put in the barges Brunette, Wall and O'Neil. Other steamers understood to be placed, but for which the contracts were not fully closed, were the Simon Murphy and Katahdin.

It is understood that Mr. Besse first came to the lakes with the intention of buying two or three good vessels at an expense of probably \$300,000. He soon learned of the very large number of old vessels, capable of carrying a great quantity of freight in the aggregate, that could be chartered for three years for a sum of money not much in excess of what he intended to pay for a few new boats. Mr. Besse now says he will go further and make arrangements to contract before leaving here for the construction in lake ship yards of from twelve to fifteen barges of about 225 feet in length and 3,000 tons capacity, built with special reference to the light draught and other requirements of the service for which they are intended. Capt. James Davidson of West Bay City talked with Mr. Besse, while in Cleveland Wednesday, about the proposed new fleet, but there was nothing of a definite nature in the conversation. Capt. Davidson said afterward. In all of the contracts it is agreed that the charterers will insure the vessels immediately upon taking possession of them. If the owner does not desire insurance, he will be paid, in addition to the charter figure, 5 per cent. of the value of the vessel each year. The insurance is being placed through Johnson & Higgins of New York. It is understood that Mr. Gilchrist will make a neat sum out of his connection with the deal, as his commission is said to represent in nearly all cases the first month's charter money.

### STANDING OF THE COMPANY.

The character and standing of the Atlantic Transportation Co. has, of course, been a matter of special interest to vessel owners who were afforded an opportunity to charter vessels, and considerable information regarding the firm has been furnished both by Mr. Besse and the mercantile agencies. The company was organized Jan. 15 of this year and was incorporated under the laws of the state of New Jersey with an authorized capital of \$3,000,000. The headquarters are at No. 1 Broadway, New York, and the officers are: Edward P. Menny, president; Haywood A. Harvey, treasurer; and Lawrence S. Mott, secretary; these gentlemen, with F. W. Roebling, Gilbert Colgate, E. F. Young, Senator James Smith, Jr., Charles P. Cutler and Edward J. Hall, constitute the board of directors. "The stipulated object of the corporation," says one of the mercantile reports, "is to conduct the business of general freight transportation, but more particularly in coal, and it has on hand coal transportation contracts sufficient to keep it busy for several years. As will be seen, the personnel of the company is representative. The majority of the men are directly or indirectly connected with telephone interests. They have no debts except a few small notes given for property purchased, and these are held by the company. They are not seeking credit in any way, and the president says that it is their intention to conduct the business abso-

lutely for cash. Of the \$3,000,000 capital about \$750,000 was spent at the outset in the purchase of vessels and a considerable portion of the stock was set aside for other purposes."

The company's fleet now in service on the coast consists of eight sea-going tugs of about 1,200 horse power each, four towing steamers and forty-two barges. There are also building at the yard of the Bath Iron Works, Bath, Me., four vessels, which will cost approximately \$48,000 each. To this fleet will be added the steamers and barges secured on the lakes, the aggregate number of which will reach forty and the twelve or fifteen barges to be constructed at the lake yards. Mr. Besse is of the opinion that it will be possible to have all the chartered vessels at Newport News shortly after Nov. 1, and the new barges to be built on the lakes are expected to reach the coast early next spring.

### OPERATIONS ON THE COAST.

Mr. Besse said during a conversation with the Review: "Our company operates on a plan which is essentially new. Our operations are confined to the water transportation of coal from Newport News to New York, Boston and other points up the coast, but the fact that we make long time contracts enables dealers to do likewise, which is, of course, an advantage to railroads, manufacturers and other consumers, the usual problem of the fluctuations in freight rates being obviated. The contracts at present held by our company involve the movement of about 4,000,000 tons of coal per year. The particular contract for the fulfillment of which the lake tonnage is designed is for the movement of 250,000 tons of coal per month from Newport News to New York, Boston and other New England points. The company has at hand sufficient tonnage to provide for the movement of about 175,000 tons per month, and the plan is to utilize the newly acquired lake vessels for the remainder, as well as in the fulfillment of additional contracts that may be made."

The kind of ships that are desired and which are being chartered are not the larger barges. The Annie M. Ash is probably the largest of them. The majority are of 1,500 tons or less. Mr. J. C. Gilchrist, whose charter of his ten wooden barges was the first contract closed by the Atlantic company, and who has been appointed agent in the transaction of business connected with the lake tonnage, seems to have had an advantage of the other lake owners, in that his contract, getting in on the ground floor, is for almost five years, while the other charters are for three years. The charter rates range from \$1,800 to \$4,800 per year, the Atlantic company agreeing to keep the vessels properly insured and holding an option permitting it to buy the vessels any time within twelve months, with the understanding that the option may be extended. Payment on charters is to be made at the Commercial National Bank, Cleveland, on the first day of each month. The highest price to be paid for any single boat will be that allowed for the schooner Charles Foster of the Gilchrist fleet, one of the largest vessels secured, and upon which payment will be made at the rate of \$400 a month. An incident, now seemingly quite amusing, is recalled by the charter of the Foster. It will be remembered that Mr. Gilchrist was laughed at by vessel men generally when he a few months ago traded a house and lot on Amesbury avenue, Cleveland, to Valentine Fries of Milan, O., for the Foster. Now the vessel is to net Mr. Gilchrist \$400 per month, while the income to Mr. Fries from the Amesbury avenue property is only \$60 per month. Many of the vessels chartered have had difficulty in securing insurance of any kind on the lakes of late year, yet, strange to say, it is claimed that they will be accepted without demure by underwriters on the coast. It will not, moreover, be necessary to sheathe these vessels for service in salt water, as some owners have supposed, a composition applied to the hulls serving the same purpose. Charter figures on the steamers have not been made public, but it is understood that \$1,000 a month was offered Thursday for the Katahdin.

Mr. Besse, in the course of his talk with the Review, refuted several unfounded reports which have been in circulation, among others a rumor to the effect that the Atlantic company would not furnish bond if desired, and another that no insurance was to be provided until the vessels reached Montreal. Mr. Besse said: "I have given vessel owners on the lakes every opportunity to investigate our institution thoroughly, and I believe that most of them have satisfied themselves as to our standing. I have not been asked for a bond in any case, although were the request made I should be ready to give it. Personally, however, I would say that if any of the vessel owners are so afraid of us that they require bonds, they had better keep their ships here on the lakes. I have found the majority of vessel men on the lakes to be shrewd business men, but there are a few who seem to regard their vessels as they would a house and lot and hold to a belief that it cannot be moved any farther than from here to Ashtabula. The mere fact that we are going to spend probably \$50,000 to take these vessels down the St. Lawrence ought to convince these people that we are in earnest. We do not intend to spend that money for nothing. We also intend to insure the boats from the time they leave the lakes. Our dealings, it would seem to me, are fair enough from any point of view."

Mr. Besse is confident that no difficulty will be encountered in taking the vessels down the St. Lawrence. They will be towed down the rapids one at a time by tugs, and officials of the tug company are also confident. There would, in deed, appear to be no danger, inasmuch as the vessels have, with a few exceptions, a draught of only 8 feet, and vessels of this draught constantly pass the rapids. Whaleback barges have also been taken through the rapids without difficulty.

The effect of this transfer of tonnage upon the lake carrying trade is in some degree problematical, but there is no doubt that the removal of bottoms whose carrying capacity both ways in a season would aggregate considerably more than 1,000,000 tons, will have some effect. It is likely to be most appreciable in the coal trade to such side ports as Portage, Escanaba, Manitowoc, Gladstone and other places on Lake Michigan. The effect will also undoubtedly be felt to a certain degree in the lumber trade.

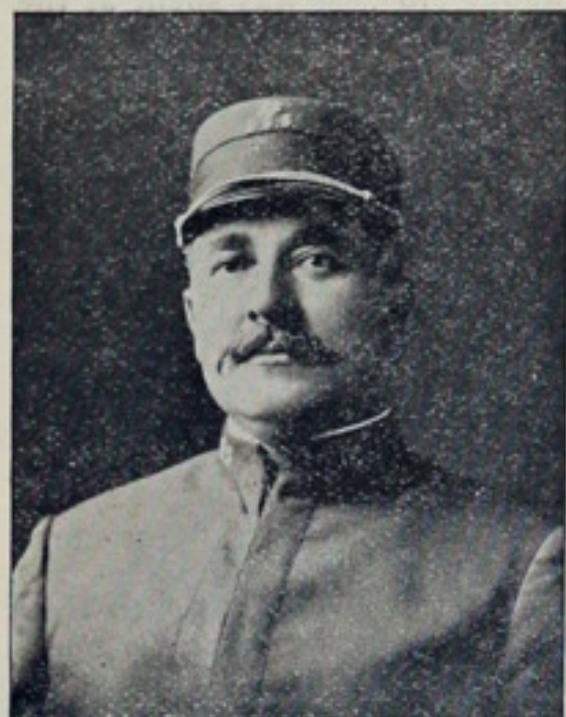


## A LIFE SAVING EXHIBIT.

IT IS ONE OF THE PRINCIPLE FEATURES OF THE GOVERNMENTAL DISPLAY AT THE TRANS-MISSISSIPPI EXPOSITION AT OMAHA.

The Review is enabled to present this week some views illustrative of what marine men who have seen it concede to be the finest demonstration of the resources and possibilities of the life-saving service that has ever

been made. The exhibit in question is at the Trans-Mississippi and International Exposition, which opened at Omaha early in June and will continue until the latter part of next month. The station erected for the crew is very handsome and is filled with as complete an equipment of life-saving apparatus as has ever been brought together in this country. The crew give a drill at 4 o'clock every afternoon except Sunday on the lagoon in front of the government building. In their drill the life-savers go on patrol, right and left from the station. The party going to the left discovers distress signals on a mast erected for the purpose, and returns to the station and reports to the keeper. The crew immediately go to the scene of the disaster with beach apparatus and shoot a line over the wreck. The beach apparatus is set up and a man is



CAPT. KNOWLES.

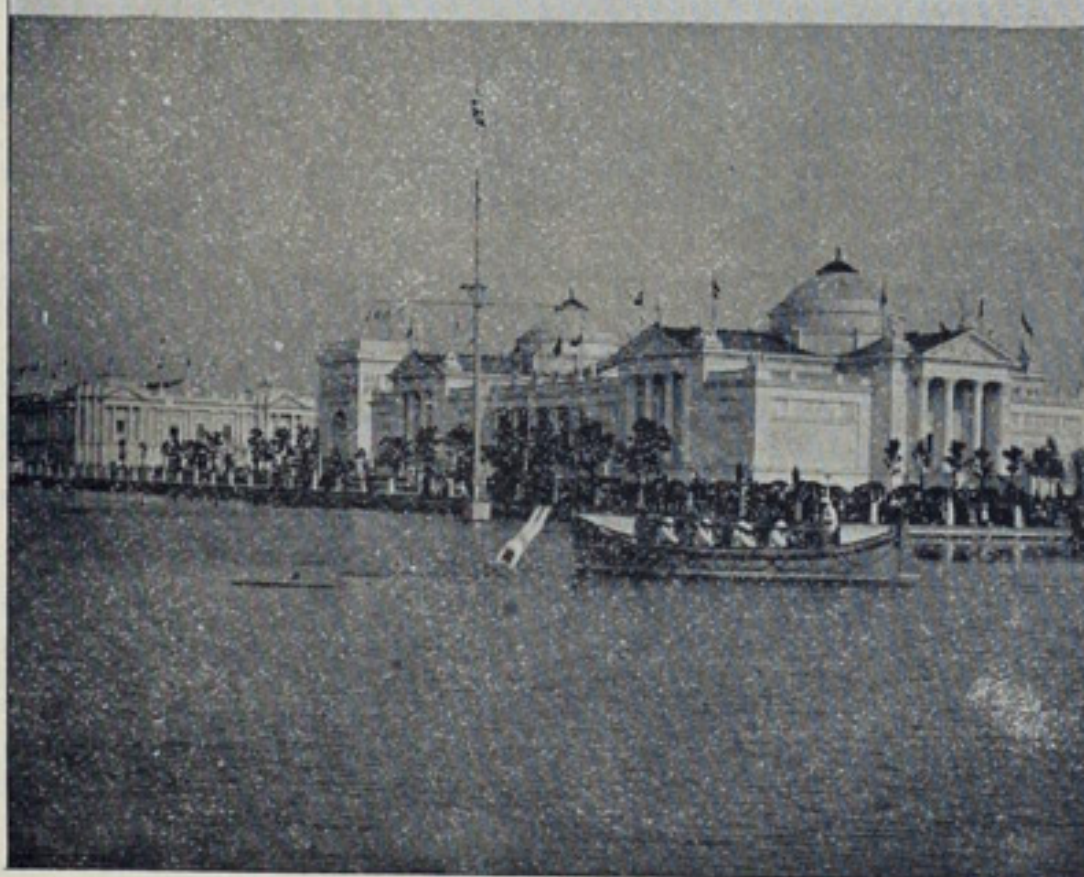
landed with a breeches buoy. At this juncture a man is reported overboard and drowning. The crew go out with the life boat and rescue the man from the water. While returning to the shore the boat is capsized, righted with difficulty and the rescued man landed in an exhausted con-

dition and apparently drowned. The drill ends with his resuscitation by the life-savers and removal to the station for medical treatment. The exhibit is in charge of Capt. H. M. Knowles of Wakefield, R. I., assistant superintendent of the third life-saving district. The crew consists of Capt. Henry Cleary of Marquette, Mich., surfmen, Henry Sinnigen of Milwaukee, Wis., Jacob Van Weelden of Grand Haven, Mich., James Scott of Sand Beach, Mich., Henry Walker of Muskegon, Mich., John McLeod of Duluth, Minn., Windfield Adamson of Grind Stone City, Mich., Frank Johnson of Holland, Mich., and Nelson Sims of East Tawas, Mich., all men from the great lakes.



CAPT. HENRY CLEARY.

Almost every man connected with the exhibit has a history in the service which makes him a peculiarly interesting personage. Capt. H. M. Knowles, in charge of the exhibit, is a native of Rhode Island. When a boy he went away to sea, and at the age of only seventeen years was a mate in the merchant service. Three years later, when the life-saving station was erected near his old home at Point Judith, R. I., he entered the crew as a surfman. After two years in this position he was appointed keeper of the station, which position he held from 1878 to 1889, when he was again promoted to the position of assistant superintendent of the third life-saving district, with the supervision of the life-saving stations on the Rhode Island coast and the coast of Long island. This territory embraces forty-two stations, and Capt. Knowles enjoys the distinction of having personally superintended the rescue work at more wrecks than any other man of his age on the Atlantic coast. In the spring of 1890 Secretary Windom appointed him a member of the board of life-saving appliances. Capt. Henry Cleary, who is in charge of the crew at the exposition station, was born near Lake Huron in 1861. He began fishing with gill nets when nine years of age and followed the lakes as a fisherman and sailor until he attained the age of nineteen. He then entered the life-saving station at Point Au Barques, Lake Huron. In 1885 he was placed in charge of the station at Muskallonge, Lake Superior, where he remained until 1891, when he was detailed to the Marquette station. Capt. Cleary has a most enviable record, never having lost a man. Among other hazardous work, he and his crew saved the men on board the steamer Pacific,



THE EXHIBITION CREW.  
SURFMAN ADAMS DIVING AFTER DROWNING MAN.



ALL HANDS MAN THE LIFE BOAT.  
RESUSCITATING THE APPARENTLY DROWNED MAN.

PHOTOS BY RINEHART.

### Life-Saving Service Exhibit at the Trans-Mississippi Exposition.

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which stranded on Lake Superior in 1887, and the steamer Charles Ker-shaw and two schooners driven ashore near Marquette.

Henry Sinnigen, surfman No. 1, has also had a decidedly interesting career. Born in Germany, he went to sea when hardly fourteen years of age and followed this life until he entered the United States life-saving service. He was barely twenty-one when he passed the examination for first mate, and at the age of twenty-six years took out papers of the highest class as a master and navigator of both ocean sailing vessels and steamers. As a licensed officer he served in the German navy, and in several voyages around the world in the merchant marine service served



as mate, officer and acting captain respectively. He was shipwrecked in the Baltic sea on that memorable night in December, 1876, when twenty-six vessels were lost there, and again in the straits of Mozambique on the east coast of Africa. He entered the United States life-saving service in 1892 at the Milwaukee station, with which he is still connected.

In a letter to the Review, Capt. Cleary states that from 6,000 to 25,000 have witnessed the drill every day since the opening of the exposition. The navy department also has a highly instructive exhibit at the exposition under the supervision of Lieut. Commander E. M. Stedman. There are models of first and second-class battleships, cruisers, gunboats and other fighting vessels, including the Vesuvius and Katahdin. The models range from 3 to 6 feet in length and cost from \$3,000 to \$5,000 each. A full-sized model of a section of a 13-inch gun is surrounded by projectiles of various sizes, and there is a comprehensive display of light machine and rapid-fire guns of every description. A great deal of attention has also been attracted to the model of a naval dry dock, built to scale, with a model of the battleship Illinois, floated into the dock from a tank, which was illustrated and described at length in the Review some weeks ago.

### A Trio of Handsome Yachts.

The management of Roach's ship yard at Chester, Pa., has been fortunate in securing, within the past few weeks, contracts for three of the handsomest yachts that will be built on the Atlantic coast this winter. There is no doubt that the award of these contracts to the Chester concern was due in a considerable measure to the evidence of the high class of the

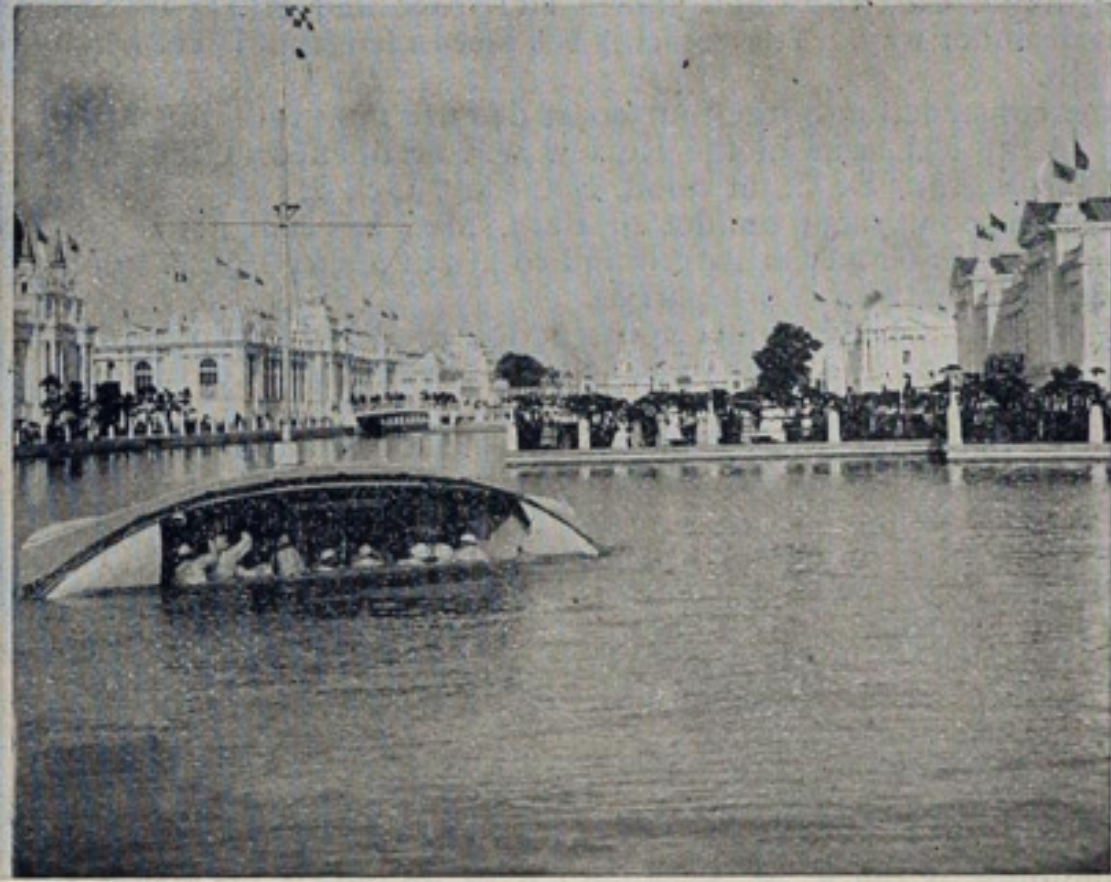
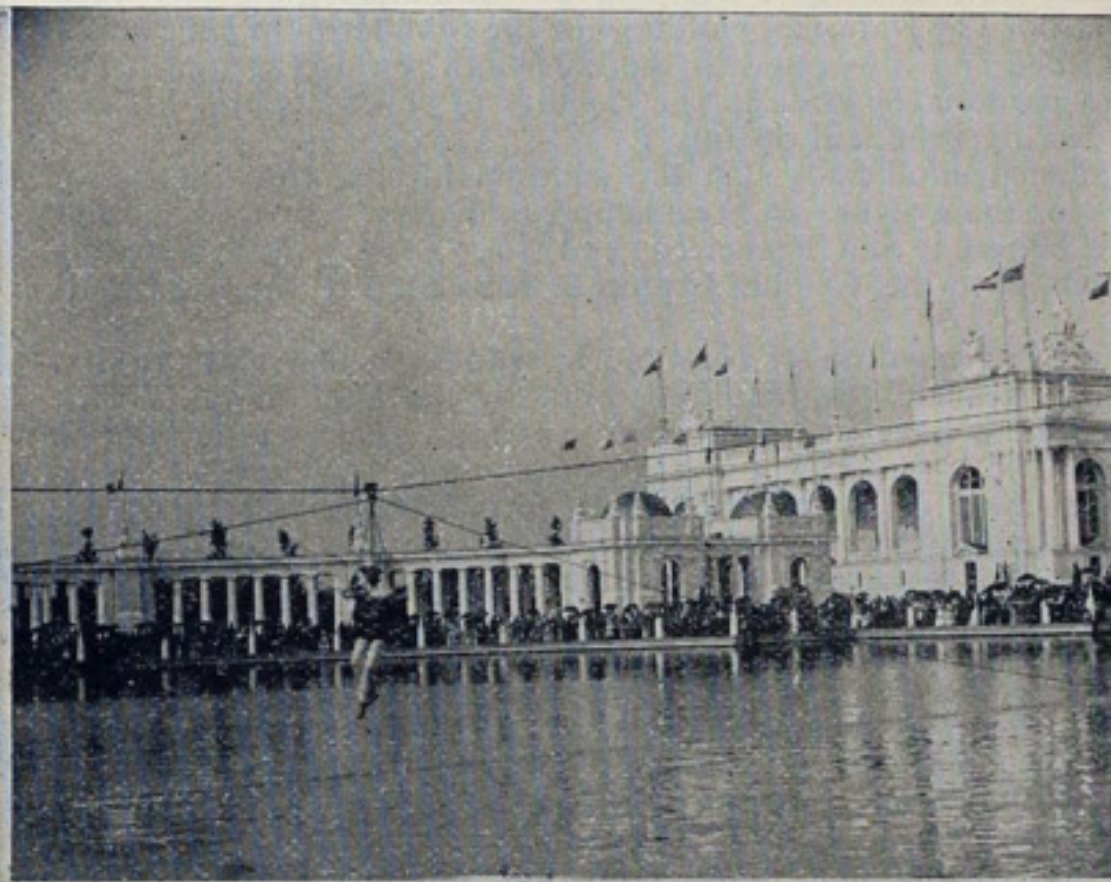
in length, and a feature of her construction will be a teak wood deck house and teak paneling about the bulwarks. The interior finish of all three yachts will be in hard wood and quite elaborate. Plans for all the yachts were made by Gardner & Cox of 1 Broadway, New York.

### GREAT FREIGHT CARRIER.

THE HAMBURG-AMERICAN STEAMER BRASILIA DEPARTS FROM BALTIMORE WITH THE LARGEST CARGO EVER CARRIED FROM THAT PORT.

Mr. J. C. Gorman, general freight agent of the Baltimore Storage & Lighterage Co., furnishes the Review with particulars regarding the cargo which the big steamer Brasilia of the Hamburg-American line loaded at Baltimore this week. The Brasilia has been breaking cargo records at almost all the eastern ports, and the present cargo is understood to be the largest that ever left Baltimore. It aggregates fully 11,000 tons (2,240 pounds), consisting of 232,000 bushels of grain and about 5,000 tons of general cargo embracing provisions, flour, oil cake, lumber, tobacco, hair, rosin, bran, oil, seeds and other commodities.

The Brasilia was completed last year and has made only about half a dozen trips to American ports. This big carrier is a 12-knot vessel and has a displacement of 20,000 tons, while her gross registered tonnage is 10,961 and her net register 8,370 tons. She is 512 feet over all, 62 feet beam and 46 feet depth, and it is claimed that her dead weight carrying capacity is fully 12,000 tons. The Brasilia has three decks and between



SHOOTING LINE OVER WRECK.  
ENGLISH LIFE BOAT GOING OVER.

BRINGING MAN ASHORE IN BREECHES BUOY.  
ENGLISH LIFE BOAT COMING UP.

### Exhibit of the Life-Saving Service at the Trans-Mississippi Exposition.

firm's work afforded by the yachts Malay and Sylph, recently turned out, and the latter of which is now being overhauled for the personal use of President McKinley. The new Aileen, which is to be constructed at the Roach yard to replace the yacht of the same name built three years ago for Mr. Richard Stevens of Hoboken, N. J., and which was sold to the United States government at the beginning of the war, will be very similar to the Sylph and Malay. She will be 150 feet in length and 20 feet beam, and have engines of 750 horse power.

The yacht to be constructed for Mr. Tompkins, a well-known resident of Boston, will be 172 feet over all and 21 feet beam, and will be capable of attaining a speed of 19 knots. Power for propulsion will be furnished by a four-cylinder triple expansion engine of 1,000 horse power, for which steam will be supplied by Almy water tube boilers. The third yacht, to be built for J. Gardner Cassatt of Philadelphia, will replace his English built yacht Eugenia, sold to the government for war service. The model of the new yacht will be on the English pattern, providing for more room and deeper draught, and it is claimed that she will be different from anything heretofore constructed in this country. The vessel will be 165 feet

each is a space of 8 feet. The equipment of the vessel is modern throughout. Projecting from her two masts and between them are nineteen booms, and on the decks are twenty-one steam winches and cranes. It is expected that with her present cargo the vessel will draw 30 feet of water, her full draught. She broke all recent cargo records at Philadelphia when on her third trip she brought to that port 7,000 tons of freight, of which 6,000 tons was sugar. Cargoes of some of the ships trading to New York are, of course, considerably larger than these. On the occasion of her former trip from Baltimore the Brasilia carried the largest shipment of cereals ever made by one vessel, but the general cargo was not of such size as in the present instance. In command of the Brasilia is Capt. Gustav Reesing, formerly of the Hamburg-American liners Asturia and Persia.

A company is to be organized at Seattle for the operation of a new Seattle-Honolulu steamship line. The new organization will be capitalized at \$100,000, and Capt. Chilcoat of Barneson & Chilcoat will be president.



## THE NEW CONTRACTS.

AWARDS OR OPPORTUNITIES FOR NEW BUSINESS IN THE SHIP YARDS—DREDGING OPERATIONS AND HARBOR IMPROVEMENTS—SALES OF SHIP BUILDING MACHINERY.

Bids for the refitting of the transport Mohawk, after the model of the steamer Mobile, now being reconstructed at Cramp's yard, are as follows: Morgan Iron Works, New York, \$98,800; William Cramp & Sons Ship & Engine Building Co., Philadelphia, \$104,000; Bath Iron Works, Bath, Me., \$82,800; J. M. Roberts Co., \$96,855; Newport News Ship Building & Dry Dock Co., \$98,500. Bids will be received shortly for the refitting of several additional transports.

As soon as the five-masted schooner now building for Capt. J. G. Crowley of Taunton, Mass., at the yard of H. M. Bean at Camden, Me., is launched, the keel will be laid for a schooner to be an exact duplicate of the J. Holmes Birdsall launched by Mr. Bean in 1894. The new vessel, which will be built for Capt. Clarence Birdsall of Tom's River, N. J., will be a four-masted schooner, 206 feet keel, 43 feet beam and 21 feet depth of hold.

The steel hull towboat Arthur Hider, building for the government, was launched last Saturday at the ship yard of Ed. Howard at Jeffersonville, Ind. The steamer building for Capt. Cooley for the Red River trade is ready to launch and will be speedily followed by the Cumberland River packet building for Capt. Tom Ryman. This will close up all the work at the Howard yard except that on the City of Cincinnati.

The Hillman Ship & Engine Building Co. of Philadelphia this week launched the harbor tug National, building for the Standard Oil Co., which was fully described and illustrated in the Review a few weeks ago. The company takes pardonable pride in the rapidity of construction, the keel for the vessel having been laid on July 7.

It is announced unofficially that the contract for the construction of three steamers for the Polynesian Steamship Co. of New York, the newly-organized line between San Francisco and the Society and Friendly islands, has been let to the William Cramp & Sons Ship & Engine Building Co.

Miller, Bull & Knowlton of New York, who have just had the first American tramp steamer, the Winifred, built by the Bath Iron Works, Bath, Me., expect to have two additional vessels of similar type built in the near future.

The Hillman Ship & Engine Building Co. of Philadelphia this week laid the keel for the fourth of the tugs for the Staples Coal Co. of Taunton, Mass., for which it has the contract. The Eureka is already in commission, the Concord will have her trial trip on Saturday, and the third tug, the Waltham, has just been launched.

Many prominent vessel men from lake cities went to Lorain Thursday for the launch of the freight steamer Clarence A. Black, building for Detroit parties by the Cleveland Ship Building Co. This vessel will be fitted with the Howden hot draft. Messrs. Calder and Mattsson of the Detroit Dry Dock Co. were in attendance.

The four-masted schooner James H. Bruce, building at Bendixsen's ship yard at Eureka, Cal., for Capt. James H. Bruce and others of San Francisco is well under way. The vessel is 166 feet in length, 37 feet beam and 12 feet depth.

Bids for the construction of the four coast defense monitors illustrated and described in the last issue of the Review will be opened at the navy department, Washington, D. C., at noon, Saturday, Oct. 1.

Charles Harrington, yacht builder of Bath, Me., has had plans prepared for a steam yacht 60 feet in length and to attain a speed of 20 knots per hour, to be built for New York parties.

The light draught steamer under construction at Perry's ship yard at Chattanooga, Tenn., for the Tennessee River Navigation Co. will be launched on Oct. 1.

The Admiral Sampson, the second of the steamers building at the Cramp's yard, to be operated under charter by the Boston Fruit Co., was launched a few days ago.

John P. Devney of Ashtabula, O., is at work upon two new tugs. The William H., the larger of the two, has just been launched, and the smaller vessel will go into the water next month.

The Cruise Steamship Co. has just been organized and has placed three steamers on the line between Seattle and San Francisco in competition with the Pacific Coast Steamship Co.

Capt. G. H. Matthews of the Sincennes-McNaughton Tug Co. of Montreal, Canada, announces that the company is now building a powerful tug at its yard at Sorell.

The tug building by the R. M. Spedden Co. of Baltimore for Baker & Whiteley of that city is well under way and will be ready for launching within a short time.

William Skinner & Sons of Baltimore, Md., have just launched a car float for the Baltimore & Ohio Railroad Co. It will have a capacity of eight cars.

Kelley, Spear & Co. of Bath, Me., have set for this week the launches of the barges Grant and Dunton, building for the Staples Coal Co.

John Wait of Potsdam, N. Y., will build a naphtha launch for use on the St. Lawrence river.

### HARBOR IMPROVEMENTS, MACHINERY, ETC.

Score another mark in the development of a foreign demand for ship material. The Scully Steel & Iron Co. of Chicago has just closed a contract for the delivery of 2,500 tons of steel plates at Victoria, British Columbia, to be used by one of the largest ship building firms on the coast in the construction of five steamships for British parties. The value of the contract exceeds \$100,000, and it was secured against the competition of the largest steel firms in England and Germany.

Alfred Box & Co., Philadelphia, will supply cranes as follows: A 10-ton electric traveler and runways for the Brooklyn navy yard; four 5-ton electric jib cranes and one 10-ton electric traveler for Bement, Miles & Co.; and an overhead trolley conveying system for the shell room of the battleship Oregon, similar to that installed by the firm in the Indiana.

The Lockwood Manufacturing Co. of East Boston, Mass., has the contract for the machinery for the new ferry boat to be constructed by

the city of Boston for service between Boston and East Boston. J. McKie, also of East Boston, Mass., has the contract for the hull and joiner work.

Pumps for the four steamers now building at Cramp's yard, Philadelphia, for the American Mail Steamship Co. and to be chartered to the Boston Fruit Co., as well as for the two steamers building at the same yard for the Ward line, will be furnished by Henry R. Worthington, New York.

Bids will be opened in the engineer's office in the army building on Oct. 3 for furnishing the government with two hand traveling bridge cranes complete, each 8,000 pounds capacity; span of bridge, 18 feet 8 inches; travel, 37 feet 4 inches. All workmanship and material to be first-class in every respect.

Bids opened Sept. 17 for furnishing steam generators for the League Island navy yard, Philadelphia, were as follows: Babcock & Wilcox Co., \$5,500; Aultman & Taylor Machinery Co., Mansfield, O., \$5,469; Heine Safety Boiler Co., \$5,133; John Baizley, Philadelphia, \$7,485.

The contract for dredging a deep channel in the harbor at Waukegan, Mich., originally let to Carlin, Stickney & Cram of Detroit, and afterward declined, has been let to the Lake Michigan Dredging Co. of Milwaukee at 14 cents per cubic foot.

Mordecai T. Endicott, chief of the bureau of yards and docks, navy department, Washington, D. C., is receiving bids on an electric light and power plant, cost not to exceed \$10,000, to be installed in the navy yard at Pensacola, Fla.

The Hilles & Jones Co., Wilmington, Del., has supplied the United States navy yard, Charleston, Mass., with a heavy plate straightening machine, capable of straightening plates 1 inch thick and 72 inches wide.

George H. Cavanaugh, Boston, has been awarded the contract for dredging the channel and building jetties at Osterville, Mass., the work to be completed by May 1, 1899. The contract price is \$13,690.

Falls Rivet & Machine Co., Cuyahoga Falls, O., which recently secured a large government contract for 5-inch shells, has been awarded a second contract for 100,000 9-inch shells.

Robert Love of Muskegon, Mich., has secured from the Detroit, Grand Rapids & Western Railway Co. the contract for the completion of the car ferry slip at the Muskegon harbor entrance.

A 35-ton electric traveling crane is to be a part of the equipment of the extension 115 by 150 feet in size now being made by the works of the Geo. F. Blake Manufacturing Co. at Cambridge, Mass.

The Burlee Dry Dock Co. of Port Richmond, Staten Island, N. Y., has placed an order with the Carnegie Steel Co., Pittsburg, for 2,000 tons of steel for ship building purposes.

Capt. R. M. Spedden of the Spedden Ship Building Co., Baltimore, has assumed the duties of president of the American Towing & Lightering Co. of Baltimore.

Bement, Miles & Co., Philadelphia, have a large order from the General Electric Co. for slotters, planers and other tools, and a foreign order for several tools of great size.

National Tube Works Co., McKeesport, Pa., has the order for boiler tubes for the battleship Oregon. Also orders for shrapnel tubes for the government.

The American Machine Tool Works, Cincinnati, has an order for about \$10,000 worth of machine tools for the Marine Institute of Warsaw, Russia.

The Russell Wheel & Foundry Co. of Detroit has secured the contract for the metal work of the New Haven, Conn., breakwater light-house.

The contract awarded by the navy department for a shaper for the cruiser Buffalo goes to Gould & Eberhardt, Newark, N. J.

The New Vancouver Coal Co., Vancouver, British Columbia, proposes to construct a new unloading dock.

## A Warning Against Overloading.

A dispatch sent out from Sandusky, a few days ago, has undoubtedly left the impression in some quarters that there is 18 feet or more of water in the channel entrance to that port, when in fact it is not safe for vessels going to Sandusky to load deeper than 16 feet 6 inches. In view of the failure of congress to provide a fund of any kind that might be drawn upon this year in emergency cases, the shipping interests of Sandusky, a short time ago, collected quite a sum of money for dredging that was required immediately. Upon the completion of this temporary work on the 22d inst., Mr. Wm. T. Blunt, United States assistant engineer, who was permitted by the department to take charge of it, make a preliminary report telling of stretches of channel that had been dredged to a depth of 18 to 20 feet (normal stage), but he was particular in stating that every effort should be made to prevent boats destined for Sandusky harbor from loading deeper than 13½ feet, as the present project for Sandusky harbor simply calls for 17 feet at mean level of the lake. The water surface at present is from 6 to 9 inches below this level, thus reducing the lawful depth to about 16 feet 3 inches, but there is full 16½ feet since the recent dredging, and that draught will very probably prevail, unless further difficulty is encountered through overloaded vessels fetching up in the channel and by the working their wheels nullify what has been done by the dredges. Referring to the conditions that prevail at Sandusky, Mr. Blunt says in a letter to the Review:

"You will greatly assist the interests of navigation if you will in some manner, as seems to you best, issue a warning in regard to over-draught of boats. In the harbors of this district, from Conneaut to Monroe, there is practically no money available for dredging. The depth of water in nearly all of these harbors, under the present projects, is but 17 feet at mean level. As the water surface now is 8 or 9 inches below this level, and will likely continue to fall, and as October and November usually bring us much westerly wind, which will at times lower the water still more, it is very evident that boats drawing even 17 feet will often have difficulty in passing through the channels. If in passing through they stop on the bottom, there results not only delay and expense to the vessel but damage to the channel and increasing trouble to succeeding boats. In most of the channels, the depths authorized by congress will be found when the water surface is at mean level, but it does not follow that boats drawing that full limit can always enter those harbors."



### City of Milwaukee Accident.

C. F. Barron, engineer of the Graham & Morton Transportation Co.'s steamer City of Milwaukee, sends the Review a few notes regarding the recent accident to the engine of his steamer. He says: "The City of Milwaukee left St. Joe at 12:30 a. m. with a very heavy load of fruit, and at 5:25 a. m., when within about 3 miles of the outside breakwater at Chicago, the main crosshead broke in the starboard journal, and but for the promptness of the second engineer, J. D. Stewart, in shutting off the steam, the machinery would have been greatly damaged." The broken crosshead was sent to C. F. Elm's machine shop in Chicago, where forces of men were kept at work night and day in making repairs. The City of Milwaukee was ready to resume her trips the latter part of last week, the repairs having been completed in seventy-two hours, a remarkably short space of time, even for a shop with the facilities of Mr. Elm's establishment.

### Launch of Car Ferry Ann Arbor No. 3.

The steel twin-screw car ferry Ann Arbor No. 3, building for the Lake Michigan service of the Ann Arbor Railroad & Steamship Co., Toledo, was launched last Saturday at the yard of the Globe Iron Works Co., Cleveland. The vessel is 270 feet over all, 259 feet on the water line, 52 feet beam and 18 feet 6 inches depth. The main deck is provided with four tracks and the necessary jack screws, chain, clamps, etc., for securing twenty-two railway cars. The hold is divided into seven compartments by six thwartship water-tight bulkheads, one of these compartments being suited to carrying 25,000 bushels of wheat. Four gangways are provided on each side of the vessel and the bow is particularly strong for working in ice.

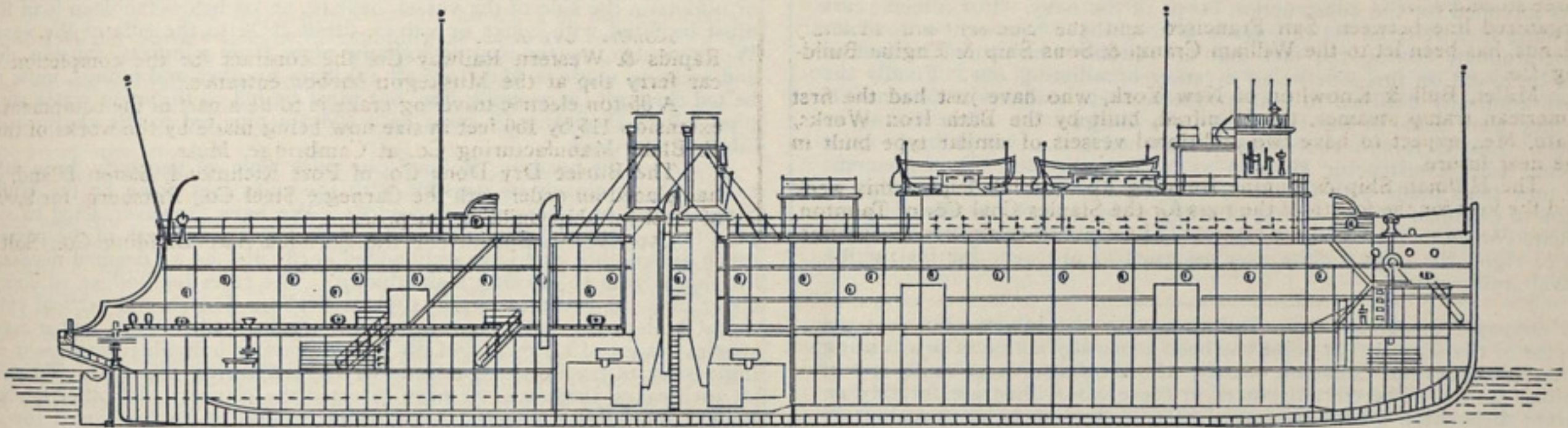
This car ferry will be equipped with two sets of horizontal, compound, direct-acting engines, with cylinders of 20 and 40 inches diameter and 36-inch stroke. Steam will be furnished by four boilers of the tubular fire-

Shubrick, No. 32, Stockton, and No. 33, Thornton, to Trigg & Co. of Richmond, Va., at \$129,750 each; No. 34, Tingey, to the Columbian Iron Works of Baltimore, at \$168,000, and No. 35, Wilkes, to the Gas Engine & Power Co. of Morris Heights, N. Y., exact amount of bid to be determined later.

As we go to press dispatches from Washington state that a new feature of the problem presented in the apportionment of the contracts has been found in the filing Wednesday of majority and minority reports by the board of construction on the advisability of confirming the contract provisionally awarded to the Bath Iron Works of Bath, Me., for the construction of the torpedo boats Barney and Biddle. The board had decided to award the contract to the Bath concern, provided it made certain changes in its plans, but this has been refused. The board therefore by a vote of three to one decided to recommend to Secretary Long that the contract should not be confirmed. Chief Constructor Hichborn filed a minority report contending that the company had already complied with sufficient requirements and should be granted the contract.

### Coast Ship Builders Interested.

Editor Marine Review:—In the Review of the 22d I have just noticed on the first page an interesting item about a prominent Atlantic coast firm seeking to buy or charter a large number of lake steamers and barges, to take them through the canals. Not long since I read that on completion of certain canals there would be something like 100 steamers and barges, averaging 3,000 tons cargo capacity, that would be able and ready to pass from the lakes to the seacoast and enter into competition with the Atlantic coast production. Being a builder of wooden tonnage, I feel somewhat interested to learn to what extent we of this vicinity are to compete with the lake product. Will you kindly give your readers information as to the location of the canals through which, in addition to the Welland, these craft can pass, and the extreme dimensions of vessels that may make the



CAR FERRY ANN ARBOR NO. 3 LAUNCHED SATURDAY BY THE GLOBE IRON WORKS CO.

box type, each 6 feet 6 inches in diameter by 14 feet long, and built for a working pressure of 125 pounds. Feed, air, fire, sanitary and ballast pumps of the duplex type will be provided. The vessel will be heated by steam and there will be an electric lighting plant of 250 16-candle power lamps. The equipment of the vessel will include two stockless anchors of 3,000 pounds each; steam windlass and steam capstan forward, and two double cylinder steam capstans on the main deck aft, one on each side of the vessel, with engines below deck and controlling gear above; steam steering gear with auxiliary hand gear, ash elevator, etc. Propellers are four bladed, cast solid, each of 11 feet diameter.

### Contracts for Torpedo Boats and Destroyers.

After considerable delay, Acting Secretary of the Navy Allen has finally announced the award of contracts for the twelve torpedo boats and sixteen torpedo boat destroyers, for which bids were opened more than a month ago. The delay in the apportionment was due to the great number of bidders. The board of construction decided that contracts should be awarded only to firms which would agree to make such changes in the plans as the board suggested. All the bidders agreed to this with the exception of the Herreshoff Co. of Bristol, R. I. Accordingly the two boats originally apportioned to the Herreshoff Co. will be built by the Columbian Iron Works, Baltimore, and the Gas Engine & Power Co., Morris Heights, New York, respectively. The formal award of the contracts for the Barney and the Biddle have not as yet been made, for the reason that there has not yet been received from the Bath Iron Works of Bath, Me., an acceptance of proposed conditions. The schedule of awards is as follows:

Destroyers.—No. 1, Bainbridge, No. 2, Barry, and No. 3, Chauncey, to the Neafie & Levy Co. of Philadelphia, at \$283,000 each; No. 4, Dale, and No. 5, Decatur, to Trigg & Co. of Richmond, Va., at \$260,000 each; No. 6, Hopkins, and No. 7, Hull, to the Harlan & Hollingsworth Co., Wilmington, Del., at \$291,000 each; No. 8, Lawrence, and No. 9, MacDonough, to Frank O. Wellington, Fore River Engine Co., Weymouth, Mass., at \$281,000 each; No. 10, Paul Jones, No. 11, Perry, No. 12, Preble, to the Union Iron Works of San Francisco, at \$280,000 each; No. 13, Stewart, to the Gas Engine & Power Co. of Morris Heights, New York, the exact price yet to be determined, as this company bid on a destroyer and a torpedo boat jointly; No. 14, Truxtun, No. 15, Whipple, and No. 16, Worden, to the Maryland Steel Co. of Baltimore, at \$286,000 each.

Torpedo boats.—No. 24, Bagley, to Lewis Nixon, Elizabethport, N. J., at \$161,000; No. 25, Barney, and No. 26, Biddle, to the Bath Iron Works of Bath, Me., at \$161,000 each; No. 27, Blakely, and No. 28, Delong, to Lawley & Sons, Boston, at \$159,400 each; No. 29, Nicholson, and No. 30, O'Brien, to Lewis Nixon, Elizabethport, N. J., at \$165,000 each; No. 31,

passage? Believing in keeping pace with all methods of progress in construction and transportation, we shall appreciate this information.

Bath, Me., Sept. 26, 1898.

WM. ROGERS.

A lengthy article in another part of this issue, dealing with the charter of a very large number of vessels that are to go to the Atlantic coast at once, will undoubtedly prove interesting to the writer of the above communication. It may be well to explain that the vessels now going to the coast are nearly all of light draught, probably not more than 8 feet in any case without cargo, and are of 1,200 to 1,600 gross tons capacity. They go to Lake Ontario through the Welland canal and then down the St. Lawrence river to the seaboard. In some places on the St. Lawrence it will be necessary to have these vessels run the rapids of the river, as the locks of canals now in use along the lower St. Lawrence are not large enough to pass such craft. It is expected, however, that within the next year the Canadian government will have completed, after a long struggle, the work of enlarging the St. Lawrence canals to Welland size, or rather to dimensions that will admit of the passage from the lakes through to the Atlantic of vessels drawing 14 feet and carrying 1,800 to 2,200 tons. These are the canals to which Mr. Rogers refers. The boats going down to the coast now are all light-draught kind and there is some risk in running them over the rapids of the St. Lawrence. Next year, or more probably in 1900, vessels of much larger capacity will go down through the enlarged canals and carry cargo back and forth.—Ed.

### Senator Hanna on our Merchant Marine.

Senator M. A. Hanna of Ohio is out in a strong declaration in favor of the upbuilding of our merchant marine. In view of Senator Hanna's prominent position in the senate and his connection with the administration, his remarks on the subject possess especial significance. Mr. Hanna is quoted as saying: "There is one question that I feel I would like to aid in bringing forward and devote my public life to it, and that is the restoration of our merchant marine. It is a matter always of importance, but never more so than now. The results of the war bring that question home to us as the vital one of the day, and it should not be neglected. We have taken a long stride toward competing on the sea with the commercial world, and the nation ought to back up its enterprising business men by giving them, at least partially, the support that other governments give their citizens. The prejudice of our people against subsidies alone prevents the building up of the merchant marine, of which we all could feel as proud as we do of our navy. I believe that capital would go into shipping, even though only small returns could be had, if it could be assured against ruinous loss in competition with the subsidized lines of other nations. I am for the Nicaragua canal and for tonnage and mail subsidies to steamship lines."





Devoted to the Merchant Marine, the Navy, Ship Building, and Kindred Interests.

Published every Thursday at No. 418-19 Perry-Payne building, Cleveland, Ohio, by John M. Mulrooney.

SUBSCRIPTION—\$2.00 per year in advance. Single copies 10 cents each. Convenient binders sent, post paid, \$1.00. Advertising rates on application.

Entered at Cleveland Post Office as Second-class Mail Matter.

The recent words of Secretary of the Navy Long in recognition of the services of the bureau chiefs of the department were fraught with no superfluous praise. As in the case of the engineers in the holds of the vessels, the bureau chiefs are men who have received all too little credit for their important part as contributing factors of the great naval victories of the recent war. Men of the stamp of Dewey and Schley, heroes though they are, would be worse than powerless were it not for the ships which Naval Constructor Hichborn and Engineer-in-Chief Melville provided for them. Nor without any thought of disparagement was it "the man behind the gun" who won the day at Manila and Santiago, any more than the man who designed and superintended the construction of the vessels wherein he fought. Everyone who has given the subject any serious thought must realize that to two men in Washington, Commodores Hichborn and Melville, is due more than to any other two men of this country the credit for having built ships that were not found wanting when a test of our navy was called for.

Another departure in the right direction has been made, upon the recommendation of Chief Constructor Hichborn, in the matter of training cadets intended for the construction corps of the navy. For fifteen years the young men selected for this grade of work have been sent abroad for a post-graduate course, the fact that no suitable educational institution could be found on this side being a rather humiliating one. Finally the British admiralty declined to longer receive these students at Greenwich, and they were sent to the University of Glasgow or other European schools. Last October a course was established at the United States naval academy with Constructor Hobson as its first director. Arrangements have now been made with the Massachusetts Institute of Technology at Boston to establish there a course of study which is to be in effect a post-graduate course to the naval academy. The term will open Oct. 1 with a class of eight, the largest class ever assigned in one year for instruction in naval architecture.

Newspaper dispatches from Duluth convey the information that the collector of customs at that point has been especially active in prosecuting the masters of several Canadian vessels, whose offenses were really not of a serious nature. The circumstances in these cases illustrate forcibly an apparent disposition on the part of some collectors to be over-zealous in their efforts to make Canadian ship masters live up to the letter as well as the spirit of the law. The seeming supposition that the chief occupation of the Canadian master is the devising of means to avoid American regulations is ridiculous in the extreme, and the allowance of a little more latitude to our friends across the border would certainly in no sense jeopardize the vessel interests of the United States.

Since the action of the last congress in appropriating money for another dam in the Ohio river, the advocates of the great plan to make that river navigable the year round have again taken heart and have organized the Ohio Valley Improvement Association for the furtherance of the work. Surveys have been made and it is estimated that the total cost will aggregate \$100,000,000. The plan contemplates the building of a series of locks and dams. It is a big undertaking but certainly more feasible than the Lake Erie and Ohio river ship-canal scheme, in the advocacy of which a number of Pittsburgers some time ago wasted considerable energy.

### MACHINERY OF LAKE SHIPS.

RULES ADOPTED BY THE GREAT LAKES REGISTER—A SUMMARY OF WHAT THE CHICAGO PUBLICATION WILL REQUIRE.

In reproducing in our issue of Sept. 15 a portion of a paper prepared by Mr. John N. Coffin, who has been associated with Mr. Walter Miller in the machinery department of the Great Lakes Register, the Review referred incidentally to another portion of the paper—the rules compiled by the register for the construction of machinery for vessels seeking classification in the Chicago publication. Mr. Coffin said:

"In the compiling of rules for future construction of machinery, it has not been our intention to create anything particularly new, or to deviate widely from the rules covering such work adopted and maintained by the older classification societies, such as London Lloyds, British Corporation and Bureau Veritas, but it has rather been our aim to carefully select and adapt such rules as may have a special bearing on the peculiar requirements of the practice on the great lakes. In this respect we have taken the rules of the older societies as our basis, simplifying them where we deemed possible and adding to them such items as seemed advisable to cover these special requirements, basing our alterations and additions on the data gathered from our survey of the 1,300 odd vessels now running on the lakes, this data showing us beyond question whether the rules which we took as our basis were sufficient or were more rigid than the requirements demanded.

"We have divided the rules into four separate heads or sections, namely, 'Engines,' 'Pumps, Piping and Connections,' 'Boilers' and 'Electrical Equipment.' Under the first heading 'Engines' we have deviated very little from the established rules of the older societies, for they cover very fully all requirements met with in lake practice. We have, however, where we could simplified the formulæ for determining the sizes of the

several parts, and have recommended, though not insisted upon, such items of more modern practice as the fitting of the propeller wheels on a taper tail shaft, with feather and nut, and the use of taper and shoulder connections of piston rods in crossheads, and have covered very much more fully than the older societies have the items of fastening of cylinders to columns, columns to bed plate and bed plate to seatings. In connection with these latter items, we have compiled very simple formulæ for determining the strength of these fastenings, and have published, in connection with these formulæ, tables showing the strength of studs and bolts of different sizes, such as are used in making these fastenings. In these rules we have also covered very carefully the points of determining the minimum size of crank, intermediate and propeller shafts; of the thrust surface of thrust bearings, so as to entirely relieve the cranks of the engines from fore and aft strains; the fastening of piston rods in crossheads, either by key or by nuts; the thickness and strength of cylinder walls and heads; and the proper staying of cylinder heads by ribs; and we have also called particular attention to the fact that cylinders and receiver chests must be fitted with relief valves of sufficient size to safeguard them from undue strain.

"Under the heading 'Pumps Piping and Connections' we have covered such points as to the necessary pumps that are required by the older societies, and as to the strength of piping for different purposes; and in addition to these points covered by the older societies, we have included such items as: First, that no pipes are to be carried through the coal bunkers without being properly protected; second, that in all steam pipes provision must be made for expansion and contraction to take place without unduly straining the pipes, and that all stuffing-box expansion joints must be fitted with safety guard bolts, to prevent the end of the pipe from being forced out of the joint; third, that in order to have full control at all times of valves and pipes connecting engines, boilers or ballast tanks with the sea, they must in all cases be so arranged that water cannot, either by accident or intention, be run into the vessel, and that in cases where pipes are led, or so placed, that water could run into the vessel from either sea or boiler, they must be fitted with non-return valves; fourth, that all inlets or outlets in the side of the vessel, near to, at, or below the deep load line, must be fitted with cocks or valves, fitted close to the side of the vessel. We have also insisted that all exhaust pipes from windlass, capstan, deck and steering engines, and from all auxiliary engines and pumps, must not be led through the vessel's side, but must be led to the main waste steam pipe, which should in all cases have a drain pipe led to the engine room bilge or hot-well.

"Under the heading 'Boilers' our rules have, of necessity, been made to comply as closely as possible with the rules laid down by the United States board of supervising inspectors. We have, however, tried to simplify those rules and the formulæ for determining strength of the parts as much as possible, and have only added such rules as we deemed necessary for safety from the insurer's standpoint. The rules for boilers, of course, cover only the common types, such as firebox, Scotch and vertical cylindrical boilers, as, with the marine water tube boilers each maker has a special design of his own, and the boilers having individual features it was impossible to lay down hard and fast rules covering this type. To cover all such cases, therefore, we have inserted the clause: 'All other types of boilers than those referred to must be submitted to the board for approval.' In this way the engineering department of the register is given the opportunity of inspection and approval of the plans of all odd types of boilers before permitting them to be installed in modern vessels looking for our highest classification.

"Under the heading 'Electrical Equipment' we have adopted almost verbatim the rules laid down by the National Board of Underwriters for the installation of wiring and apparatus for electric light and power, adding to these rules only such features as were particularly applicable to marine practice, one of the most important of which is the rule that all lamps in cargo holds must be on a separate circuit, run direct from the switchboard, and with a pilot lamp on the switchboard to detect current on this circuit when the cargo hold is closed. In this connection, I might say that a number of losses to the insurance companies have occurred recently, from damage to grain cargoes from faulty wiring and connections in the cargo holds, the lamps in cargo holds of many of the vessels now electrically lighted being simply branch lights, taken from the main circuits of the equipment. In cases where this method of equipment is used the only way of switching off the lights in the cargo holds is by the local switches at the lamps; and, after the cargo hold has been filled and closed, it is impossible to tell, either from the engine room or decks, whether the lights in the cargo hold are burning when the current is on the main circuit or not, and it is consequently impossible to tell whether there is danger of fire in the cargo or not. Our other rules for electrical equipment are those common to all societies governing the apparatus and installation of electrical equipment for lighting and power."

### New Coaling Station for the Navy.

Authority will be asked of congress at its next session for the establishment of additional coaling stations, in accordance with the recommendations just made by a special board appointed early in the summer with Admiral Belknap as chairman. The board visited every town with deep water front from Maine around to the Tortugas, and recommendations are made for the establishment of at least half a dozen stations. The only stations with which the navy is at present supplied are those at Key West and Norfolk, and by reason of the shallow water at both these ports the greatest difficulties are encountered in coaling any but the smallest ships. Indeed, the battleships cannot approach nearer than five miles to the coal base at Key West. In addition to the recommendation for the establishment of coaling stations at several points on the Atlantic seaboard from Portsmouth, N. H., south, and on the gulf as far west as the mouth of the Mississippi, especial emphasis is laid on the value of a station at Porto Rico. The new stations are to have capacities of 5,000 to 20,000 tons of coal and will cost from \$100,000 to \$200,000. Bids received for the construction of the new coaling station at Pago Pago, Samoa, are as follows: Cotton Bros. of Oakland, \$133,387; Risdon Iron Works, \$255,000; Joseph McMahon, \$162,000; California Bridge Co., \$154,000; Ely Tibbitts, \$142,000; King Bridge Co., Cleveland, \$217,000; City Improvement Co., \$207,000; San Francisco Bridge Co., \$164,000.



## DISTILLING SHIPS.

A DESCRIPTION OF APPARATUS IN THE U. S. S. RAINBOW AND IRIS THAT IS CAPABLE OF PRODUCING MILLIONS OF GALLONS OF FRESH WATER DAILY.

Immediately following the outbreak of the war it became necessary to make elaborate preparations for supplies of fresh water, not only aboard the numerous merchant vessels that were hastily pressed into the great auxiliary naval fleet, but also in connection with the assembling of troops in the Cuban campaign. Two vessels, the Rainbow and Iris, purchased by the government and fitted out as distilling ships, furnish an interesting study from an engineering standpoint of the progress that has been made in this line. Distilling and evaporating plants for these vessels, as well as the Vulcan and fifteen other ships, were designed and built by M. T. Davidson of 43-53 Keap street, Brooklyn, who some time ago purchased all the patents of Chief Engineer Geo. W. Baird of the navy for apparatus of this kind and who has since added a number of improvements. The following description of this apparatus, taken from the last number of the Journal of the American Society of Naval Engineers, will be understood to refer to the Rainbow, but that of the Iris differs from it in minor details only:

The evaporators, twelve in number, together with the distillers or condensers, of which there are four, three feed and two brine pumps and three feed heaters, are placed between decks in a compartment just abaft the engine room. The circulating pumps for distillers, which are also used for discharging fresh water from storage tanks, are located in the port after end of the engine room. There is provided a total storage capacity of 700 tons, namely, 400 tons in the double bottom and about 300 tons in tanks in the hold space immediately below the evaporating plant.

**Evaporators.**—There are twelve evaporators, arranged in four sets of three, there being two sets of three on each side of the ship, space being left between these sets for the distillers with their air pumps, and for the brine pumps. The evaporators have cylindrical steel shells, 5 feet 6 inches inside diameter by 6 feet 2½ inches between heads, and straight brass tubes, 1½ inches outside diameter, expanded at each end into the tube sheets of steam manifolds or heads. The front steam head is bolted to a casting riveted to heads of evaporators. This casting contains at the top a pipe with nozzles for steam, communicating through openings of proper area with the steam head, and at the bottom similar openings and passages for the water condensed in the tubes. This arrangement insures that the tubes may be removed without disturbing any pipe connections whatsoever. The evaporator shells are designed for a working pressure of 50 pounds, and the coils and all parts subject to full boiler pressure for a working pressure of 150 pounds per square inch. Each contains about 320 square feet of heating surface. The tubes of each evaporator are arranged in two separate nests, so that one-half can be withdrawn for scaling or repair while the other half is left in position, if so desired. Blank bonnets are provided, closing up the steam and drain openings, so that one-half the tubes of any evaporator may be withdrawn for scaling or repair, while the other half remains in operation. It is the intention to operate each of the four sets of evaporators on the triple-effect system ordinarily, but the piping between the evaporators of each set and to the distillers or condensers is so arranged, and valves so disposed, that any one of a set may be cut out and the remaining two worked in double effect, or so that all may be worked in single effect. The steam or vapor pipes between the first and second and the second and third evaporators of each set are 6 inches in diameter; between the third evaporator of each set and the condensers, the pipes are 8 inches in diameter.

**Distillers or Condensers.**—For condensing the steam or vapor from the low-pressure evaporators, or from all the evaporators when worked single effect, four distillers or condensers are provided, two on each side of the ship, each fitted with an air pump, upon which it is mounted. The distillers on each side are so connected that the steam may be passed into either one or into both. They are of the usual design of auxiliary condensers as used in naval vessels, the tube ends being packed with cotton tape and screw ferrules. The inlet and outlet nozzles, 6 inches in diameter, for circulating water are so placed that the distiller bonnets can be removed and the tube ends exposed without breaking the pipe connections. Each condenser has a 9-inch nozzle for steam connection from the evaporators, and a 2-inch opening for a drain connection from the low-pressure evaporators, to be described below. The cooling surface of each condenser is about 300 square feet.

**Feed Heaters.**—There are three feed heaters, each containing about 52 square feet of heating surface. The shells are of cast iron, and each contains three coils of copper tubing, 1½ inches outside diameter, tinned inside and outside, of 10 convolutions, arranged so as to be readily accessible for scaling and repairs. Each heater is fitted with the necessary nozzles and connections with stop valves for inlet and outlet of feed water for evaporators, and for inlet and outlet of exhaust steam from pumps and for the drain water from high pressure evaporator tubes. One of the feed heaters, in addition to the connection with the exhaust steam and drain water just mentioned, has another inlet and outlet with separate valves for the drain water from coils of low pressure evaporators.

**Feed Pumps and Pipes.**—There are three 6-inch and 4-inch by 8-inch steam pumps for feeding the evaporators. These pumps draw from the overboard discharge pipe for the condenser circulating pumps. Each pump discharges into a 2-inch pipe leading to one of the feed heaters, with valves so arranged that the feed heater may be cut out and by-passed, and also so that evaporators operated under a vacuum may be fed by gravity. There is fitted a communicating pipe between the feed pump discharge pipes to feed heaters, with valves so located that any one of the pumps may discharge through any one of the feed heaters. The feed outlet from each heater is 2 inches diameter, and branches into two 1½-inch feed mains, one for the six evaporators on each side. Each 1½-inch main divides into two 1¼-inch branches, each of which branches will lead to the two evaporators on each side of the ship worked at the same pressure. This arrangement, being repeated for each of the feed outlets from the feed heaters, will result in three separate mains similarly branched, each main feeding evaporators which are worked at the same pressure. The feed outlet for each feed heater will, however, have a 2-inch connection

and stop valve to each of the feed mains above described, so that any pump may feed any evaporator.

**Traps and Drains.**—The tubes of each evaporator are drained by a Nason trap. These traps are fitted with by-pass pipes and valves, and discharge into each of two drain mains, with valves to direct the flow to either. Of these mains, one is piped to join the exhaust pipe from the pumps. Beyond this junction the exhaust pipe, which is 4 inches in diameter, will have branches with stop valves to lead into each of the feed heaters. The drains from the feed heaters are collected into a 4-inch pipe leading to the auxiliary condenser and to the boiler feed tank, with pipe branches and valves to direct the water to either one. There will also be a by-pass pipe with valve to lead the exhaust and the drain water to the condenser or feed tank without passing through the feed heaters. The second drain main is piped to lead into one of the feed heaters, and the drain from this feed heater is, under these circumstances, piped to lead to the condensers. There are by-pass pipes and valves, so that drain water passing through this main may be directed into the condensers without flowing through the feed heater.

**Brine Pump and Connections.**—There are two pumps, similar in all respects to the feed pumps, for pumping brine from the evaporators. These pumps are on opposite sides of the ship, each piped to drain the hot brine from the six evaporators on the same side, and discharge it overboard through the outboard delivery of the condenser circulating pumps. By-pass pipes and valves are fitted between suction and discharge pipes at each brine pump, so that the evaporators under pressure exceeding atmospheric may be blown out without using the pump. The brine-pump suction pipe is made 2 inches diameter throughout, the branches, from the evaporators, each fitted with a packed plug, being 1¼ inches in diameter.

**Circulating Pumps and Connections.**—There are two single cylinder Davidson pumps, 10-inch and 14-inch by 14-inch, for circulating sea water through the condensers, and also for discharging fresh water from the storage tanks and double bottom. They are located in the port after end of the engine room. The sea-suction valve is fitted close to the pumps, and suction branches lead from it to each pump, each guarded by double valves, to minimize the chance of salt-water leaks into the fresh water suction. The fresh water suction pipe is at the opposite end of the pumps, branches to the pumps being fitted with double stop valves as on the salt water side, and for the same reason. From the fresh water suction main two branches are led, one connecting with the double-bottom suction manifolds and the other with the tank-suction manifolds, of which there are two, located in the engine room, one on each side of the middle line of the vessel. The circulating pumps discharge to a distributing manifold with branches and valves for salt water discharge to distillers, and for fresh water discharge to deck. These pipes are so led and valves so arranged that one pump may discharge to the condensers while the other is delivering fresh water to hose manifolds on upper deck. The discharge pipes from the air pumps are combined in a common main and deliver into a pipe terminating in the fresh water suction main of the circulating pump. At this point there is a stop valve at each side of the discharge pipe from air pump, so that the plant may continue in operation, using one of the circulating pumps, while the other is distributing fresh water. Between the fresh water discharge to deck and the fresh water suction main a by-pass pipe with valve is arranged for filling the storage water tanks from hydrant on shore, and the air pump discharge pipe above mentioned joins this by by-pass pipe. The fresh water discharge pipes to deck terminate at each side of the ship in a discharge manifold, each with eight 2½-inch hose valves and hose connections. The storage water tanks in the hold aft of the engine room are arranged in two tiers, the upper tanks being connected by a pipe to the tanks immediately below. From each of the lower tanks a 2½-inch suction pipe leads to the suction manifold in the engine room on the same side of the ship.

**Air Pumps and Connections.**—Each distiller is mounted on a 6-inch and 8-inch by 10-inch air pump of the Davidson pattern. Each pump draws from its condenser and discharges to the fresh water tanks as described above.

**Steam and Exhaust Pipes.**—The main steam pipe of the evaporating plant is 7 inches diameter, decreasing in diameter as branches are taken off. There is a 2½-inch branch with stop valve to the steam manifold of each evaporator, and pipe branches of proper diameter for the various pumps. The live steam branches to the first-effect evaporator of each set of three are fitted with a reducing valve. The exhaust branches from the different pumps unite in a 4-inch main. This main leads fore and aft in the evaporator room, and has 2½-inch branches and stop valves to direct the exhaust steam into the live steam pipes of the first effects, on the low pressure side of the reducing valves aforementioned. There is provided also a branch of the full size of the exhaust pipe with stop valve, so that the exhaust steam may, if desired, be led to the feed heaters, there being provided an athwartship pipe of 4-inch diameter joined at each end by the drains from the high pressure evaporator tubes, this main being connected with the feed heaters through 2½-inch branches with stop valves, as described under the heading of "traps and drains." There is fitted also a by-pass pipe with stop valve, so that the exhaust steam and drain water from high pressure evaporators may by-pass the heaters and be led directly to the auxiliary condenser or the feed tank.

The navy department has assigned the three battleships for the construction of which contracts were recently let. The Ohio will be built by the Union Iron Works of San Francisco, the Missouri by the Newport News Ship Building & Dry Dock Co., and the Maine by the William Cramp & Sons Ship & Engine Building Co.

A force of 200 Japanese officers and seamen have arrived at Philadelphia to man the cruiser Kasagi, just completed at the yard of the William Cramp & Sons Ship & Engine Building Co. The vessel will go to England to receive her armament and is expected to leave that country for Japan not later than Dec. 1.

There is, of course, something back of the persistent rumors regarding new Atlantic express steamers for the American line, but officials of the company in Philadelphia refuse as yet to make public any part of their plans.



## COAL BILLS ON LAKE STEAMERS.

TESTS OF THE WHALEBACK, THOMAS WILSON—A SAVING OF 28 PER CENT. CLAIMED FOR HOWDEN DRAFT.

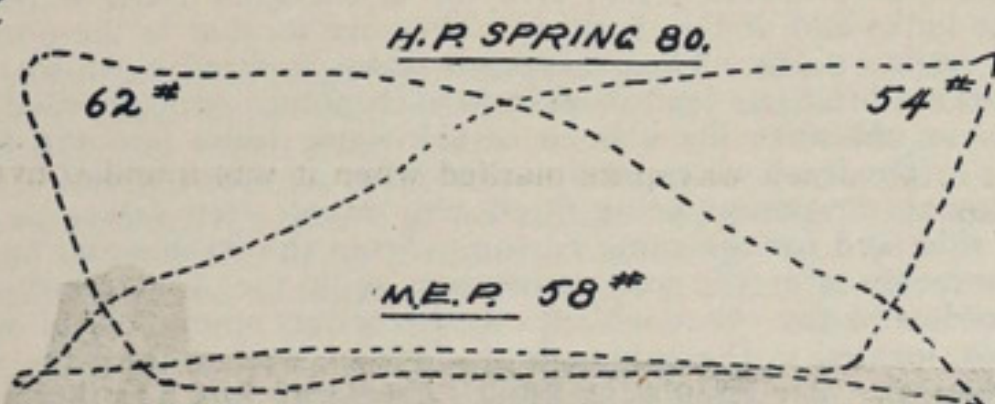
A saving of 28 per cent. in coal consumption! Such is the difference found in two tests made on the whaleback steamer Thos. Wilson—one of them before Howden hot draft was applied and the other following application of the draft. The items of coal consumption are: With natural draught, 2.3 pounds per I. H. P. per hour; with Howden equipment, 1.644 pounds per I. H. P. per hour; or a saving of 28 per cent. "We have several tests of this kind," says Mr. Gilbert N. McMillan of the Dry Dock Engine Works, Detroit, "and the owners of the vessels, who have their representatives on these trials, have no objection whatever to our giving out the information for the benefit of others who have ships on which fuel bills can be cut down."

The Thos. Wilson affords a particularly good illustration of the working of this draft, as no change of any kind was made in her other than the installation of the draft apparatus. The first test, in October, 1897, was conducted under the direction of Mr. Mattsson of the Dry Dock Engine Works and Mr. Arnold, chief engineer for Pickands, Mather & Co., who operate the Wilson. The second test, in June last, was conducted by Messrs. Logan, Calder and Mattsson, Mr. Logan representing the owners. Cards were practically the same in both cases, so that only one set is used.

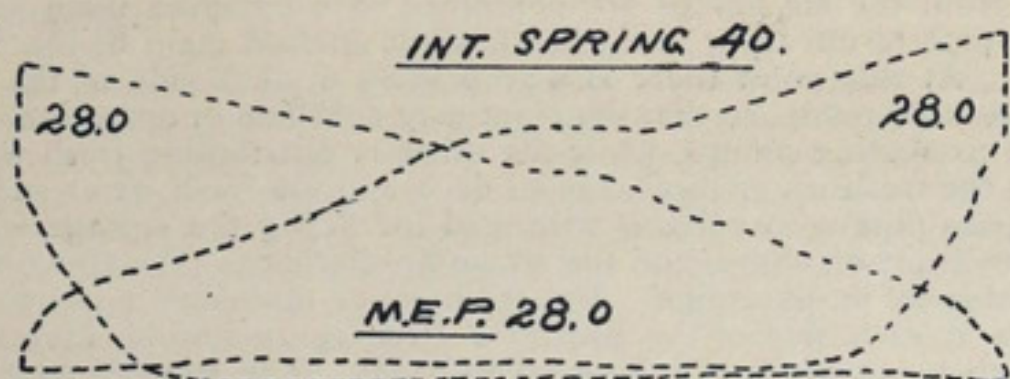
TRIAL OF S. S. THOMAS WILSON, NATURAL DRAFT.

Particulars of vessel—Full load of iron ore but no tow; engine, triple expansion with cylinders 20, 32 and 54 inches diameter by 42-inch stroke; air pump connected, 30 inches diameter, 15 inches stroke and 13 inches

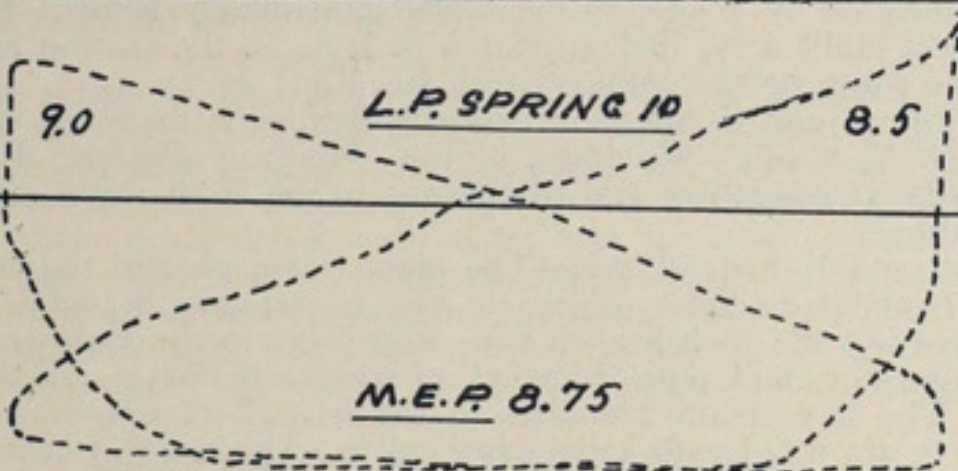
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diameter of trunk; boilers, two Scotch, 11 feet 6 inches diameter by 13 feet long and allowed 160 pounds of steam; two furnaces, 44 inches diameter; total heating surface, 3,400 square feet; total grate surface, 88 square feet; ratio of heating surface to grate surface, 38.6.

Trial data—Steam pressure, 160 pounds; vacuum, 22¾ inches; mean effective pressure, H. P., 73½ pounds; mean effective pressure, I. P., 24½ pounds; mean effective pressure, L. P., 6½ pounds; ref. M. E. P., 24.82; indicated horse power, H. P., 376; indicated horse power, I. P., 325; indicated horse power, L. P., 247; total indicated horse power, 948; revolutions, 78½; ratio, H. P. to G. S., 10.7; ratio H. S. to H. P., 3.58; time of test, 6 hours 5 minutes; coal burned, 13,244 pounds; coal per hour, 2,178 pounds; coal per hour per I. H. P., 2.3 pounds; coal per hour per square foot of grate surface, 24.7 pounds; temperature of hotwell, 135 degrees; temperature of injection water, 61 degrees; temperature of engine room, 88 degrees; H. P. of air pump, 8.6; ratio, H. P. main engine to H. P. air pump, nine-tenths of 1 per cent.

TRIAL OF S. S. THOMAS WILSON, HOWDEN DRAFT.

This test was made between Detroit and the Sault, June 13, 1898; vessel towing two barges, all light; particulars of engines, air pump, boilers and furnaces, same as in previous notes; total heating surface, 3,400 square feet; total grate surface, 73½ square feet; ratio, 46.3; length of grate, 5 feet; fan, 56 inches diameter of wheel by 28 inches discharge; fan engine, 6 by 6 inches.

Trial data—Steam pressure, 150 pounds, average; receiver pressure, 53 pounds, 5¼ pounds average; vacuum, 23¾ inches, average; mean effective pressure, H. P., 57.79 pounds; I. P., 28.12 pounds; L. P., 8.63 pounds; M. E. P. ref. to L. P., 25.7 pounds; revolutions, 78; indicated horse power, H. P., 293.3; I. P., 370.7; L. P., 326; total, 990; air pressure, 1¾ to 2¼ inches; ratio, H. P. to G. S., 13.5; ratio, H. S. to H. P., 3.43;

time of test, 6 hours 5 minutes; coal burned, total, 9,900 pounds, run of mine; coal per hour, 1,628 pounds; coal per hour per indicated horse power, 1.644 pounds; coal per square foot of grate, 22.2 pounds; temperature of air in heater, 210 degrees; temperature of injection water, 52 degrees; temperature of feed water, 140 degrees; average speed of vessel per hour, 9.45 miles; slip of propeller, 24 per cent.

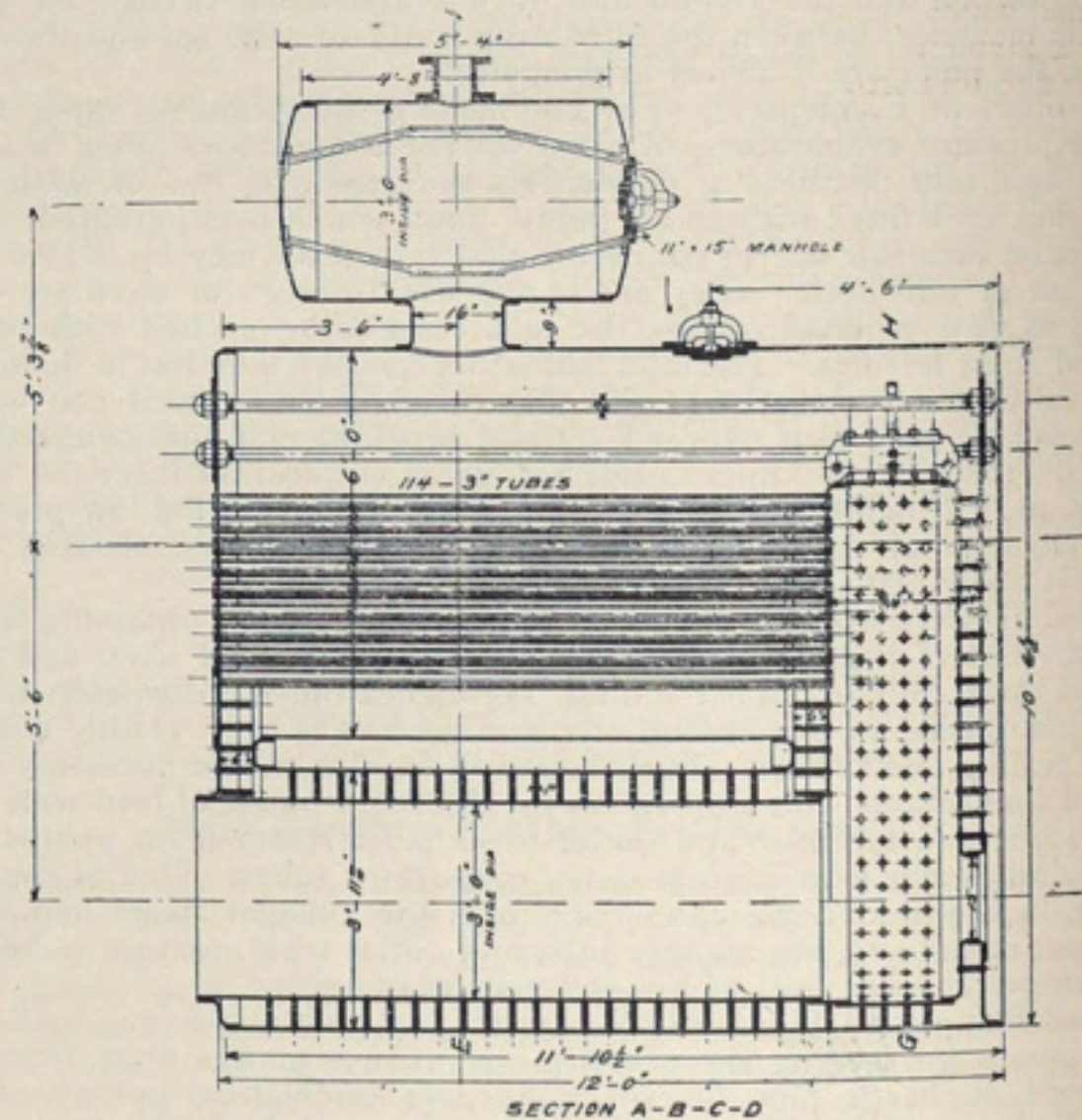
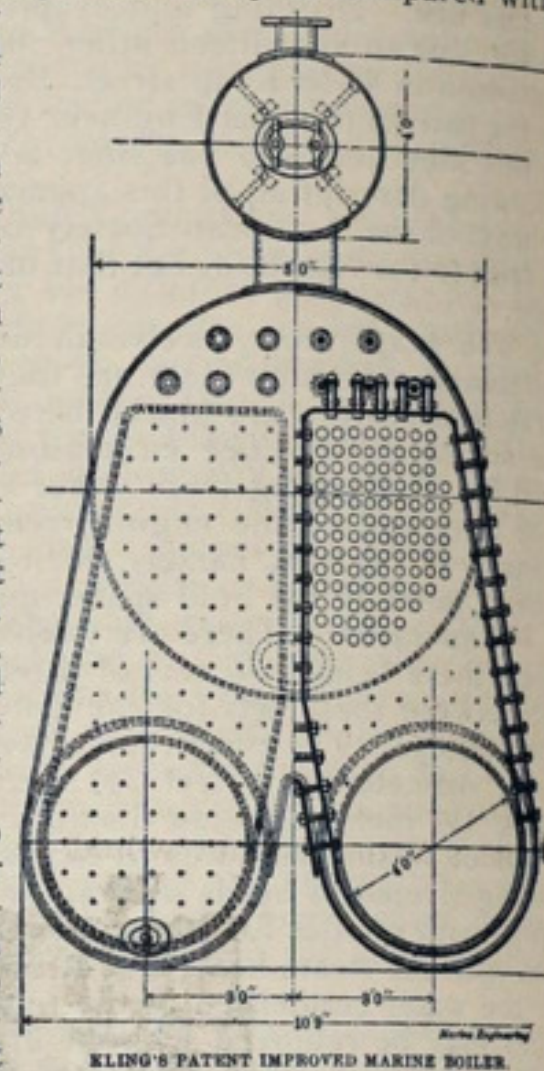
## Kling's Patent Marine Boiler.

There is illustrated herewith a new form of marine boiler, invented by Kling Bros., 287 Hawthorne avenue, Chicago, which has been placed in the harbor tug James A. Quinn of Barry Bros.' line, Chicago, and the performance of which has been remarkably satisfactory as compared with the boiler it replaced. The former boiler

was of the ordinary fire-box type, 7 by 14 feet, while the Kling boiler is 6 by 12 feet, occupies much less space on account of its shape, and steams faster on two-thirds the fuel consumption of the old boiler. This steam generator consists of two triangular, water-jacket ends, a water-jacketed combustion chamber at the rear, two cylindrical, water-jacketed fire-boxes and a cylindrical boiler containing 114 3-inch tubes with expanded ends. A 15-inch man-hole in the rear end gives ready admission to the combustion chamber without disturbing anything, and the 6-foot boiler shell gives 20 inches of steam space, thus giving dry steam at all times. The great height of steam dome and the uniform thickness of the water-jacket combine to make it almost impossible to prime this boiler.

The Quinn has been taken down to Chicago's "Mud Lake," with a boiler inspector aboard, to find whether foaming would occur, and is frequently in the greasiest portions of the Chicago river without experiencing any difficulty whatever. The boiler offers great facility of inspection externally, being merely three cylinders, supported by two ends, and the flues, grates and furnaces can be readily examined from either end. The furnaces may be of any size, to suit the fuel desired, and either plain or corrugated. The circulation of water through the ends and about the furnaces is so regular and constant that the boiler steams very rapidly. The total absence of braces also renders internal inspection easy and certain. When first put into the Quinn, wrought iron doors were used on the furnaces, but it was discovered that unless the furnaces were closed perfectly tight, the small amount of combustion that was allowed to go on would run up the steam immediately on every stoppage. Air-tight furnace doors of cast iron were substituted, and now practically no fuel is consumed during stops.

This boiler has a total heating surface of 1,038 square feet, divided as follows: Tubes, 840; furnaces, 88; combustion chamber, 110; grate sur-



face, 36. The ratio of heating surface to grate surface is 1.26, although this can be changed at will within very wide limits, as previously stated. As compared with the Scotch boiler, it may be as well to state that an 8-foot shell of the Kling type is equivalent in steam capacity to a 12-foot shell of the Scotch type, the length being the same. The items of fuel consumption and space occupied, as noted in the case of this tug, are, of course, of the highest importance. Mr. J. Barry states that the Quinn's boiler has been used for five weeks without cleaning, while boilers of other tugs require blowing off every two weeks to prevent priming.

Mr. Wills, who had charge of the machine shop of F. W. Wheeler & Co. at West Bay City, has flattering offers from the Harlan & Hollingsworth Co. and from the Maryland Steel Co., to engage in similar work. He will probably engage with the Harlan & Hollingsworth Co.



**St. Lawrence Passenger Service.**

Editor Marine Review:—I was under the impression that our traffic manager, who has been in the west, would have answered in your last issue the letter of Capt. Thomas Wilson, which appeared in your issue of the 8th inst. Finding on his return that he had not done so, I beg to state, that the reason Capt. Wilson, on his return some four weeks ago from Chicoutimi to Quebec on the steamer *Carolina*, belonging to the Richelieu & Ontario Navigation Co., had to pay for his rooms a second time, was that his room ticket, purchased in Montreal, was a round-trip ticket, and he neglected before leaving the steamer at Chicoutimi to get a stop-over on it good for his return. All tickets are returned to the head office to be checked at the end of each trip, and when he rejoined the steamer, therefore, on another trip, he had nothing to show and there was nothing on board to show that he had paid for his rooms, so the purser had to collect. On the trip going to Chicoutimi the purser did not know he was getting off there; the captain knew, but, naturally, presumed his tickets were all right. Being already provided with tickets from Montreal, he had little or no occasion to go to the purser except to get a stop-over on his round-trip room tickets, his other tickets being separate tickets. The purser does not usually collect tickets. He issues and exchanges them. The man who gives out the keys is the person who generally collects the room tickets. The agent at Montreal gave Capt. Wilson a round-trip room ticket to save him the difference in cost between it and separate tickets. The agent makes a practice of telling purchasers of round-trip tickets that they can get a stop-over ticket from the purser, and presumes he did so in this case; but even if he did not, if Capt. Wilson had exercised the care usual with travelers, he would have inquired before leaving the steamer why it was that he had his passage and meal tickets all right for his return, but nothing for his rooms. This is the first case in which this difficulty has occurred as far as I can ascertain.

Practically the double payment only amounted to his being out of his money during the time necessary for the application for refund to pass through the head office. In a case of this kind, a refund is a matter of certainty with respectable companies. Mr. Browne, our traffic manager, told him the amount would be refunded. His failure to state this leads

could have made six trips a week as easily as four, thereby increasing the accommodation one-half, but the rush began and finished without warning, and there was no time to give such notice as is necessary to make any running arrangement efficient. It is not likely the company would keep their steamers only partially employed if the traffic warranted fuller employment.

Montreal, Sept. 21, 1898.

C. F. GILDERSLEEVE,  
Gen. Mngr. R. & O. Co.

Mr. Gildersleeve also included in his letter a couple of paragraphs about the beauties of the Saguenay and about expenditures of his company for improvements but this was cut out, as it was of an advertising nature. The letter was submitted to Capt. Thomas Wilson, with a view to allowing him to make short answer to it, so as to avoid, if possible, further controversy on the subject.

"I supposed this matter was at an end," he said, "but the letter of the R. & O. Co.'s general manager calls for a few explanations. We got off at Ha Ha Bay on the way up the Saguenay; or, rather, the boat did not stop at Ha Ha Bay going up, to be exact, and we remained aboard until she stopped there returning. The distance from Ha Ha Bay to Saguenay, the end of the boat route, is only about 10 miles by land and about 25 miles by water. While at Ha Ha Bay I noticed there was nothing in our tickets covering rooms for the return trip, but as I arranged to go from Ha Ha Bay to Chicoutimi on the same boat, the *Carolina*, with the same purser who was dealing with us all the time, I thought I would have the matter arranged on the way up. I submitted the tickets to him again, but he simply told me they did not call for rooms. I thought it strange, but supposed the mistake had been made by the agent at Montreal, and went on with the intention of paying for rooms and fixing up whatever little difference there was when I got back to Montreal. When I waited over a day at Montreal to see Traffic Manager Browne, he said the purser should have given me a ticket for return rooms when he took up my stateroom tickets going up. Of course if I had known it was necessary, I should have been on the lookout. But even when I sought information, I often found difficulty in getting it, on account of the French accent of the crew, which was quite marked when it was found convenient to have it so."

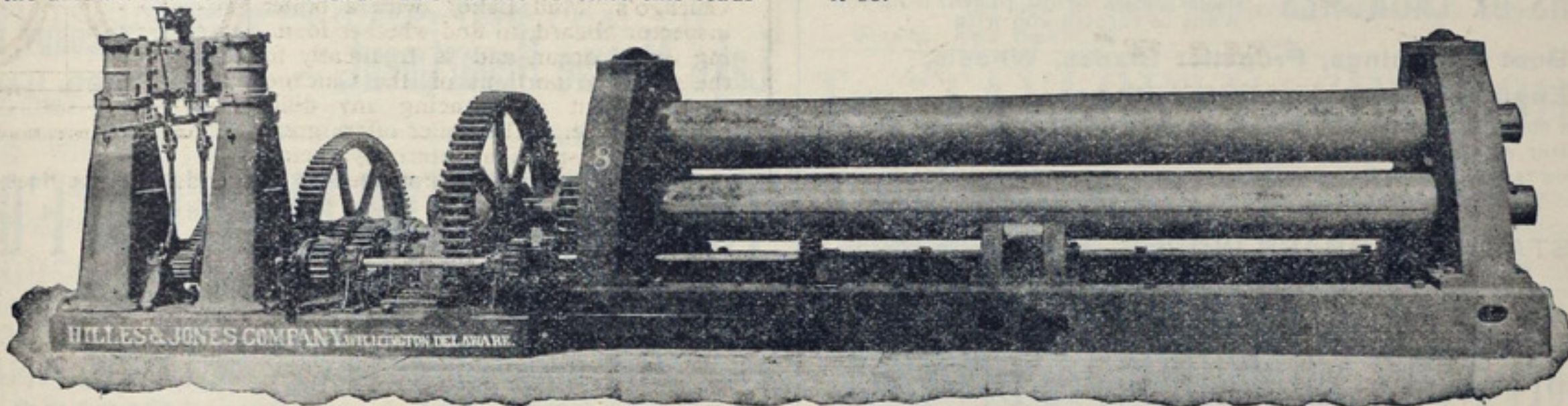


PLATE BENDING AND FLANGING ROLLS.

to the unfair inference that the company was trying to hold on to it. The refund, which allows for the partial loss of use of the rooms as well as the extra payment, passed the passenger department in August and was remitted to him since the date of his letter.

Now, in regard to his having to wait for his rooms until late in the afternoon on the day of his return: There were five or six rooms given out before he got any to parties who had either telegraphed before he did or had engaged them for the round trip from way ports, as the list put on board at Quebec shows. Round-trip engagements take precedence, and when a person with a round-trip ticket gets off at a way port, he loses his precedence. In the afternoon before reaching Riviere du Loup, he went to the purser's office and complained about not getting his rooms, and while he was there some passengers holding round-trip tickets came up and announced their intention of getting off at Riviere du Loup, and asked for stop-over for the return to Quebec. The purser gave him the two rooms vacated by them, and these were the first rooms he was entitled to under the rules. Later on the purser asked him how he liked his rooms, and he said they were very nice rooms. Again before 8 p. m. the purser offered him another room vacated by passengers getting off at Murray Bay, but he said he had enough. The real sum and substance of his grievance appears to be that, on a trip when the steamer had more passengers than on any other during the whole season, he had to wait the greater portion of the day before he got his rooms. Of course, this was aggravating, but, if he had accepted, as I think he should, the offer of the captain's room (which was not limited to the day only, as he infers, but was intended for the night as well) he would have been more comfortable. In his travels in the future, and I hope they will be many, I trust he will never experience anything worse than this. His expression "ladies' steerage," referring to the usual first-class ladies' cabin on the main deck aft, is unfair, and his statement as to passengers standing waiting for meals is exaggerated.

I deny most emphatically that the steamers referred to, the *Carolina* and *Canada*, constitute a miserable service as alleged. They are both first-class steel steamers of over 260 feet in length, speedy, weatherly, with ample and well furnished stateroom and other accommodation for all the requirements of the route, and the commendations we receive for our Saguenay service are almost universal. In the spring and fall the Saguenay, a less expensive steamer 220 feet in length, makes two trips a week for local business. For the three months of pleasure travel the *Carolina* and *Canada* usually make four trips, and for one month of this period, from July 18 to August 18, they are pretty well filled. The route being at the extreme north and east of the other routes, involves a longer distance in reaching it and returning from it. The season, therefore, is shorter than on most of the others. During this summer, as is well known, the travel was not distributed as evenly as usual. On this route in June and July it was the lightest in my experience; and in August, at the time in question, it was heavy. If this could have been foreseen, the *Carolina* and *Canada*

**Plate Bending And Flanging Rolls.**

A large set of bending and flanging rolls, recently built for the Harlan & Hollingsworth Co., ship builders of Wilmington, Del., by the Hilles & Jones Co. of the same place, is illustrated herewith. This machine was especially designed for flanging plates up to 20 feet in length, as well as for bending. The top roll is 23 inches diameter, bottom rolls 20 inches diameter, and the distance between the housings is 20 feet 6 inches. There are two slots in one of the bottom rolls, so that plates which ordinarily require riveting on of angles can readily be flanged cold and save not only the weight but the labor of riveting on the connecting angle. As will be noticed, the machine is massive in construction throughout. The bed plate of box form under the housings is 15 by 18 inches in section, and a heavy supporting stand takes the spring of the bottom rolls, bringing the flange out as near straight as possible. The driving gearing is of cast steel, and there are two speeds, one intended for the ordinary bending capacity of 1-inch plates 20 feet long, and the other intended for the flanging at a slower speed. The bearings of the top roll are provided against the side thrust of flanging by a special design of housings. The top roll is raised and lowered by the same pair of engines through a friction clutch, either end being adjustable independently of the other.

The flanging cold of plates of this character has been found to be very economical, work being done quickly and accurately, and the builders furnish smaller machines of same general type for lighter work.

Back of all the talk about big ship building plants in New York there is just one project that is worthy of notice. A big corporation is being formed for the erection of one of the largest plants in the United States in the immediate vicinity of New York city. Particulars have thus far been carefully guarded but they will be given out shortly. It is not a Carnegie enterprise, and the story about the Carnegie interests putting up a ship and gun plant in New York is absurd. The Carnegie company has undoubtedly been planning for a long time to go into the manufacture of guns on a large scale, but not to have anything to do with ship building.

**Notice to Ship Masters.**

The undersigned will remain at Sault Ste. Marie the balance of this season, for the purpose of piloting boats to Georgian bay ports. He is a man of twenty-four years' experience on Georgian bay. Masters requiring a pilot for the bay will please telegraph before leaving Duluth or Fort William, and note probable time of arriving at the Sault.

CAPT. M. LEROUX,

Fountain House, Sault Ste. Marie, Mich.



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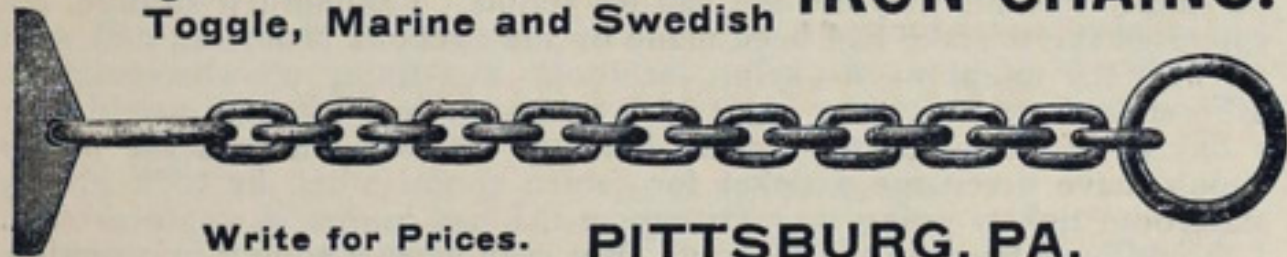
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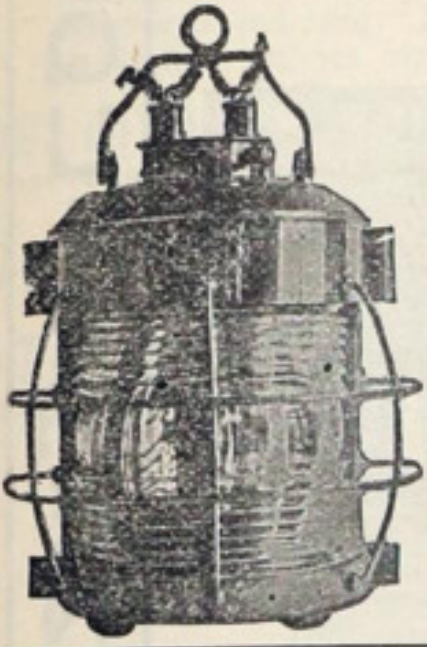
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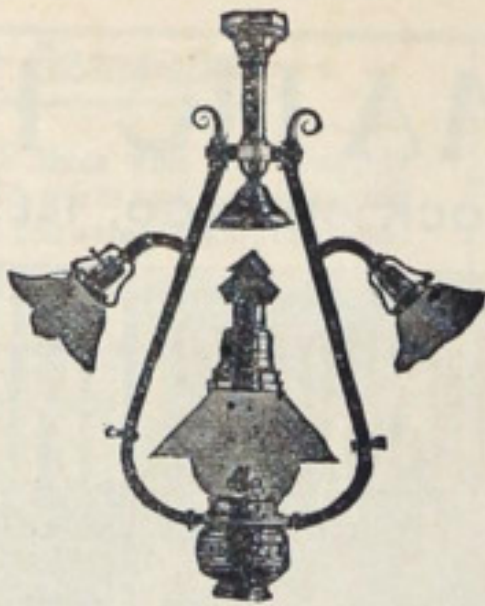


# MARINE LAMPS



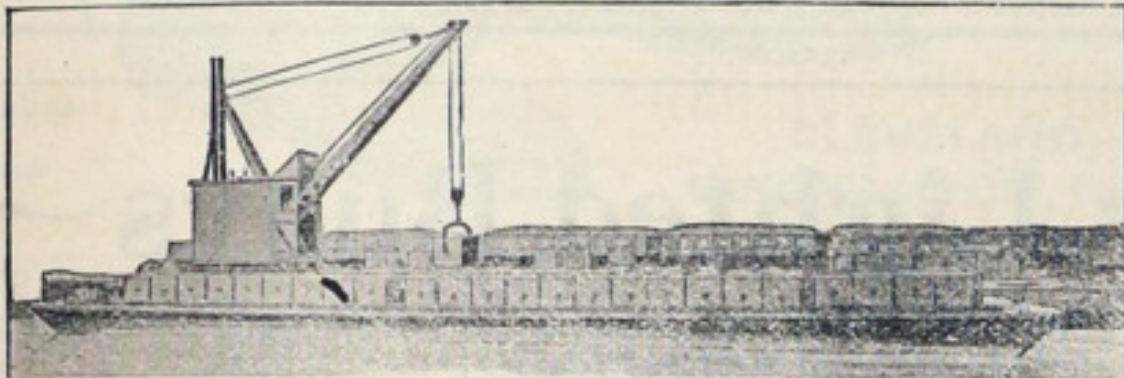
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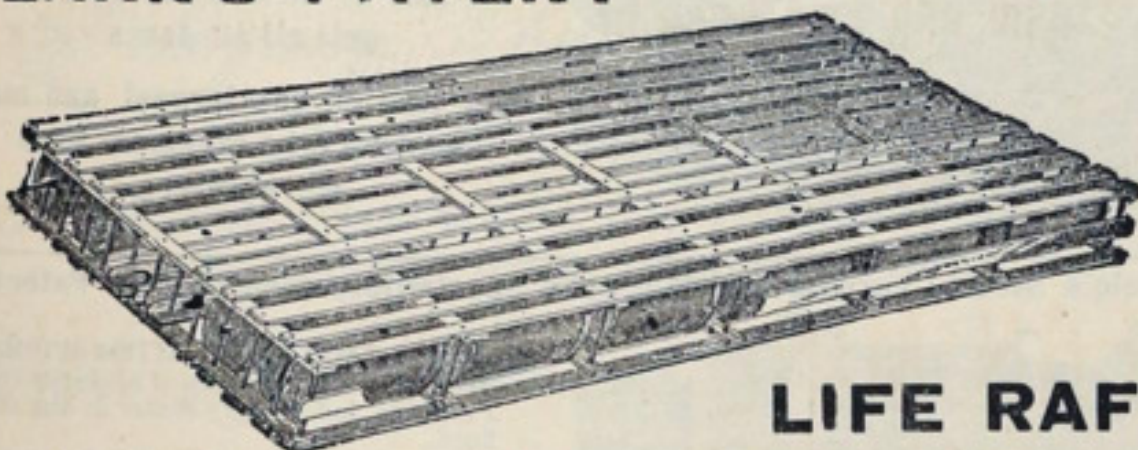
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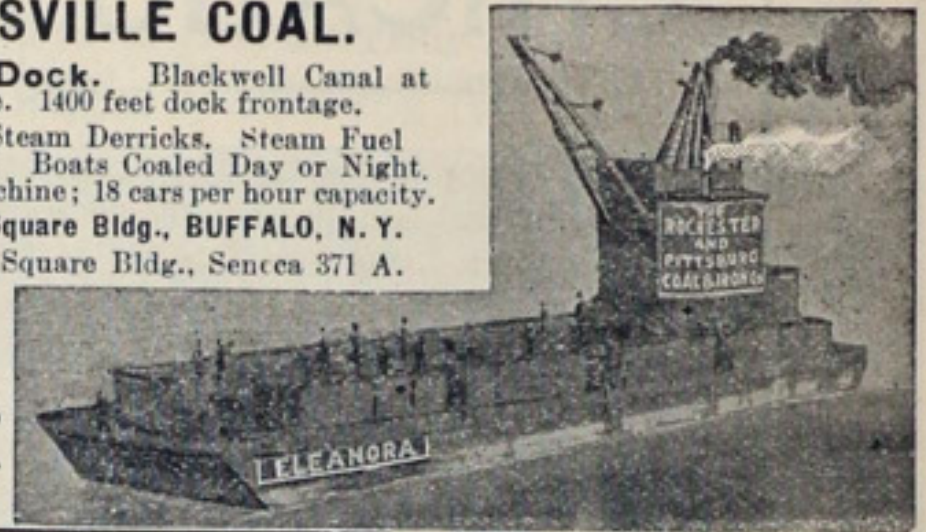
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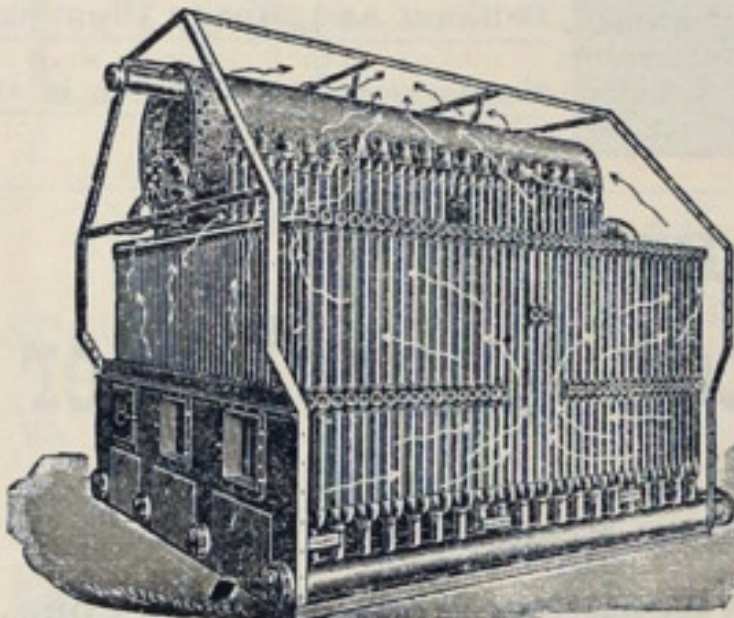
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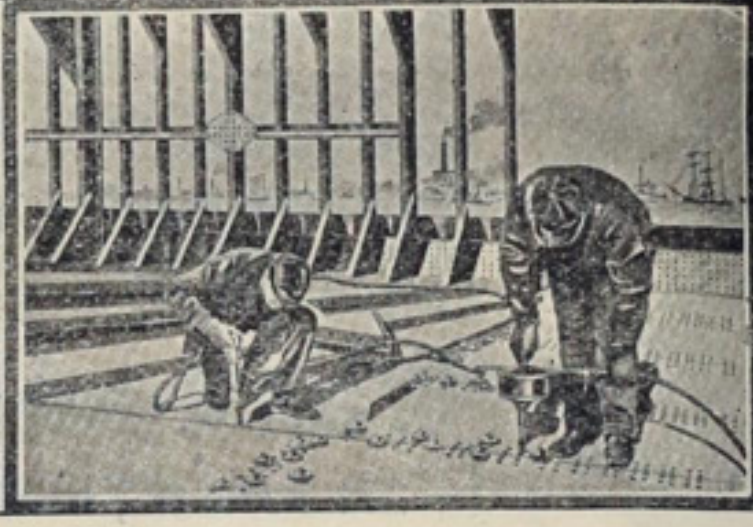
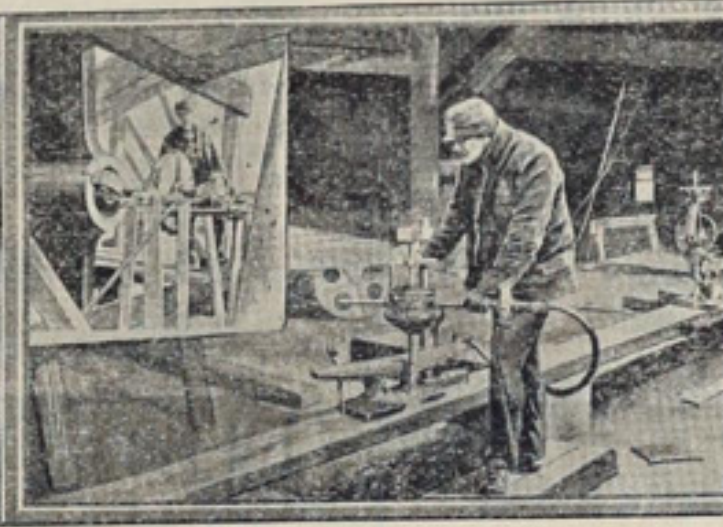
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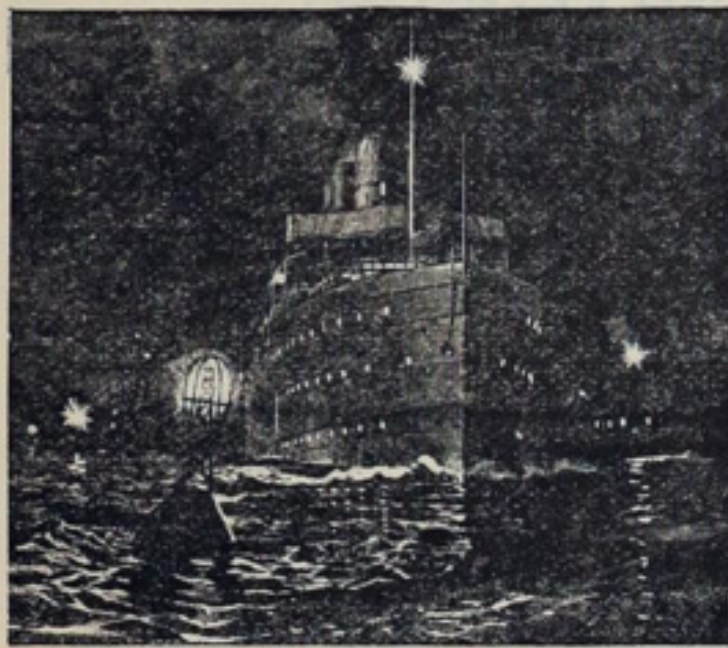
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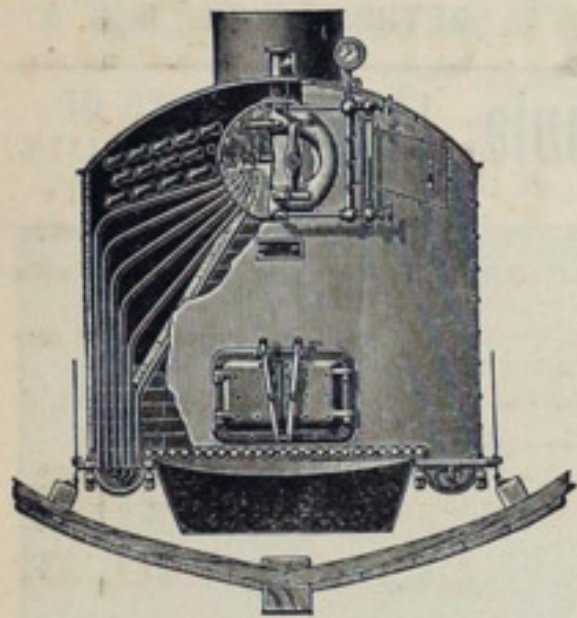
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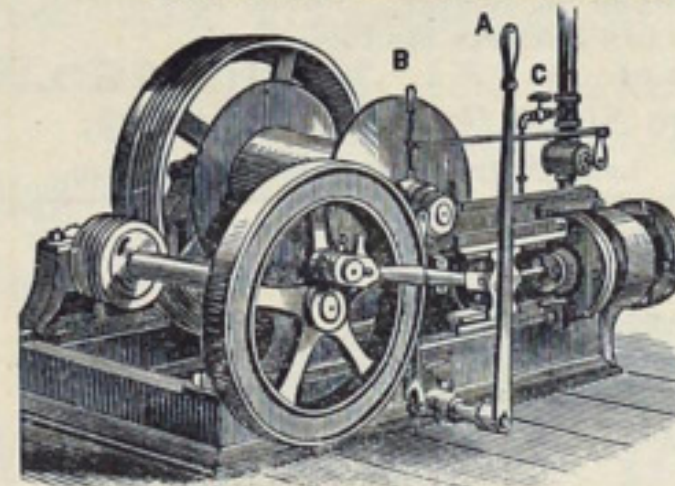
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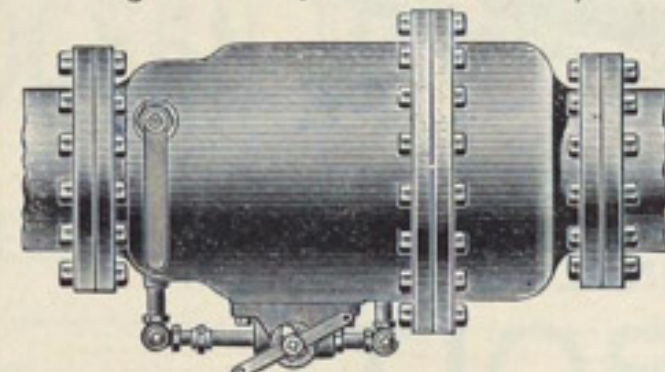


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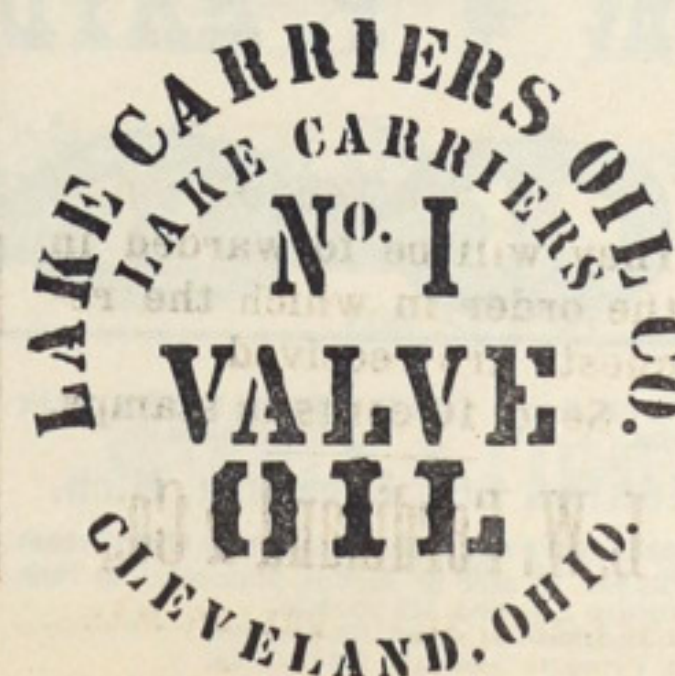
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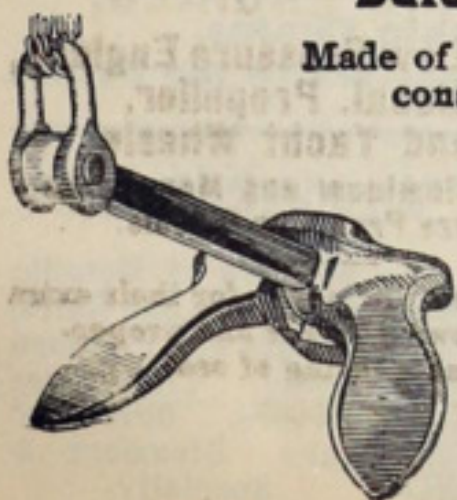
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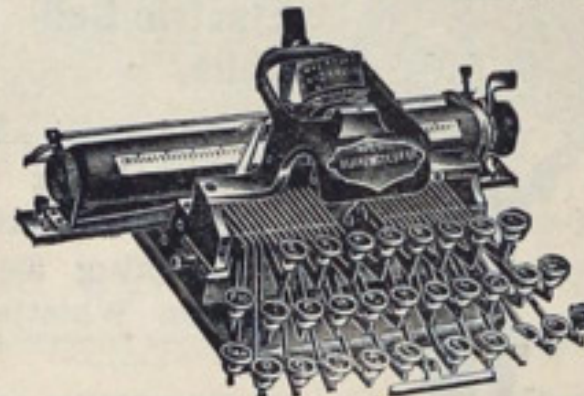
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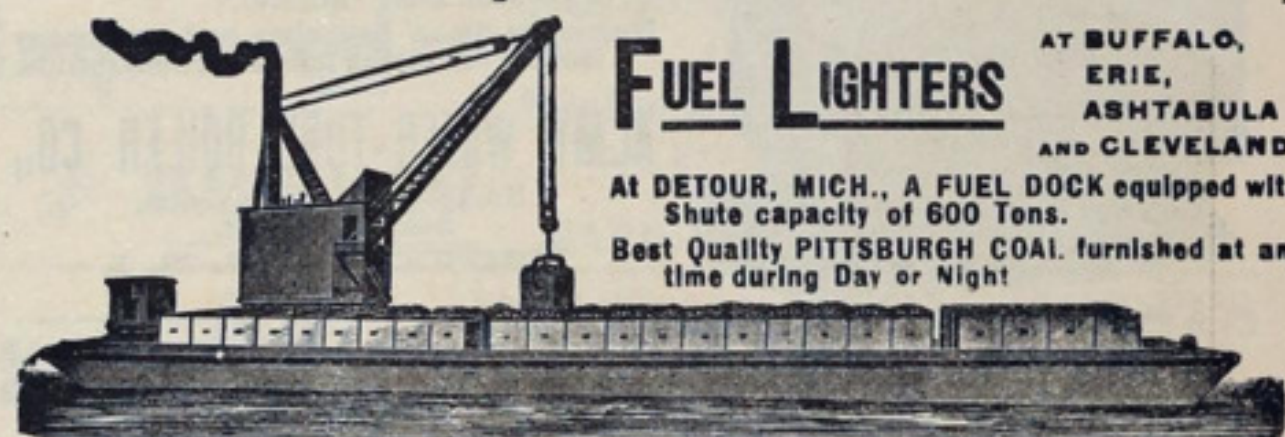
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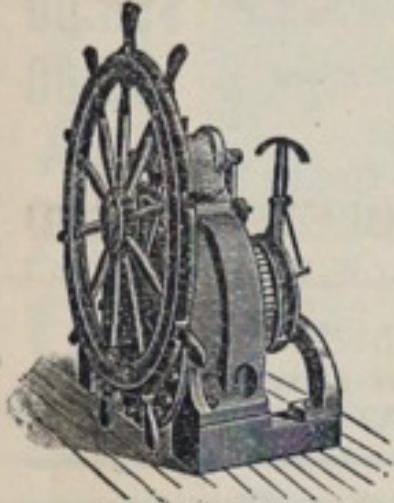
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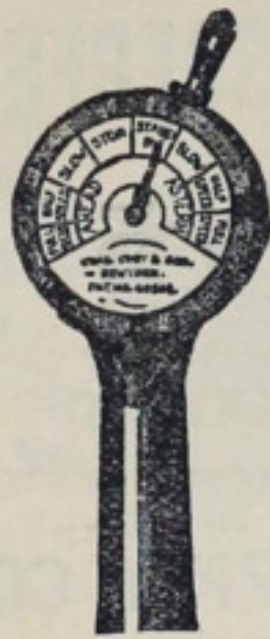
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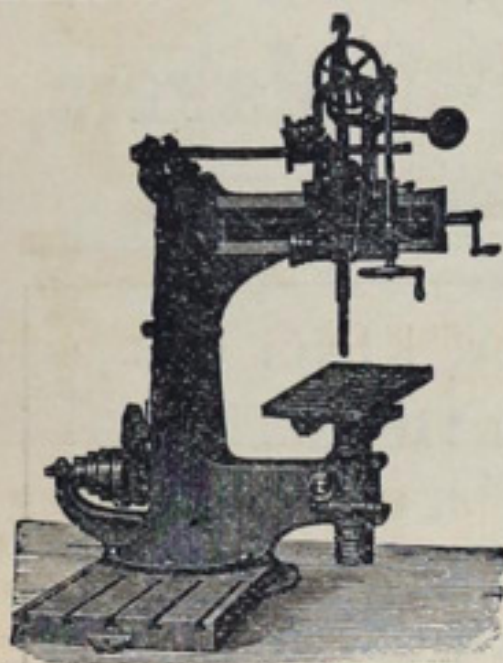
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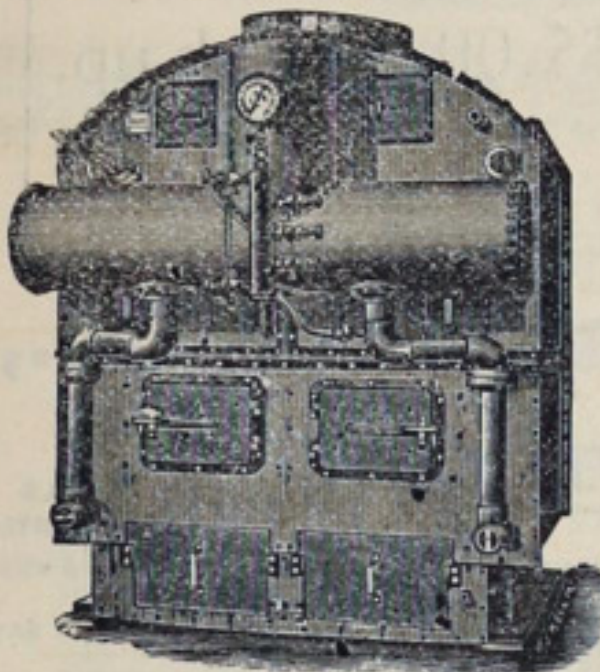
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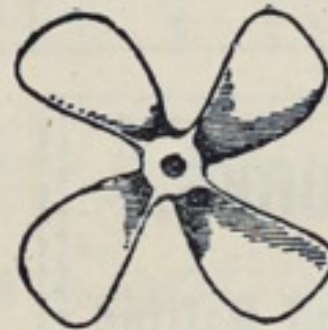
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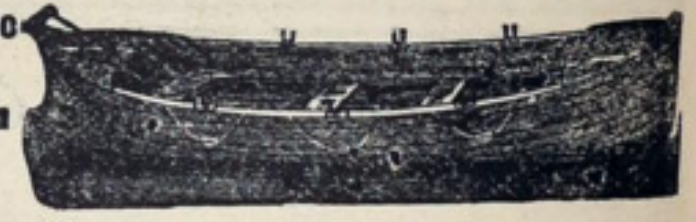
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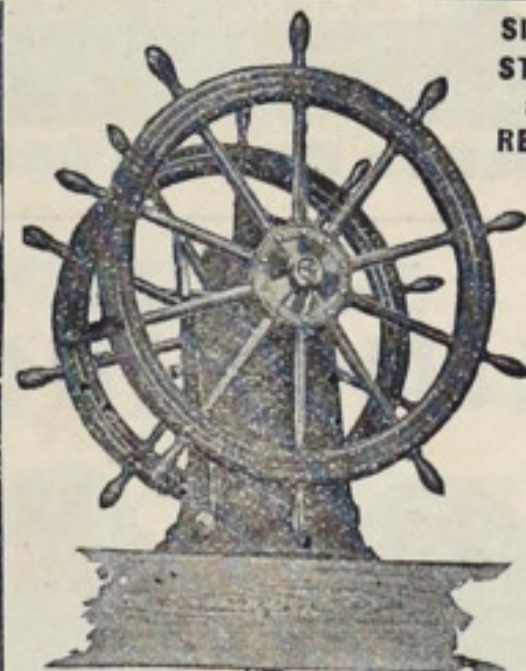
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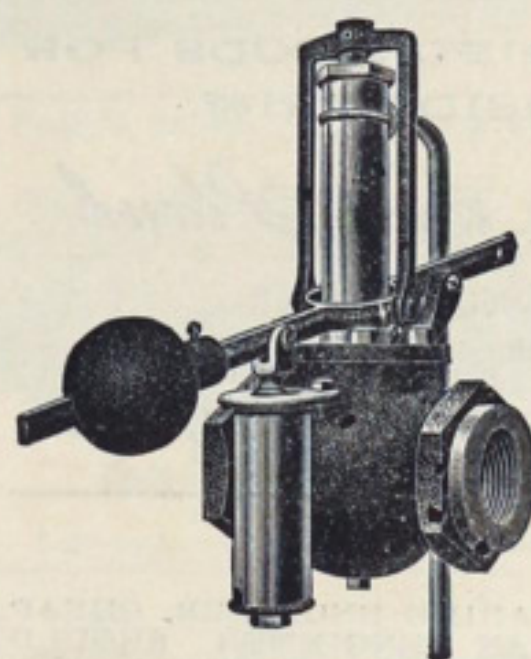



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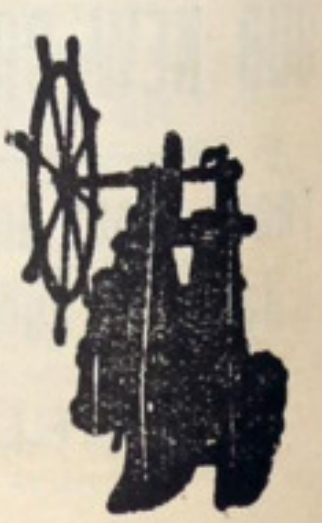
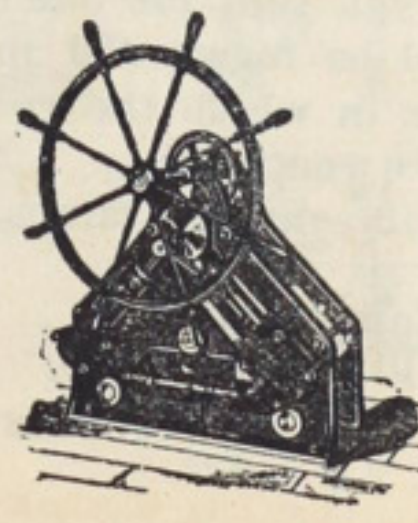
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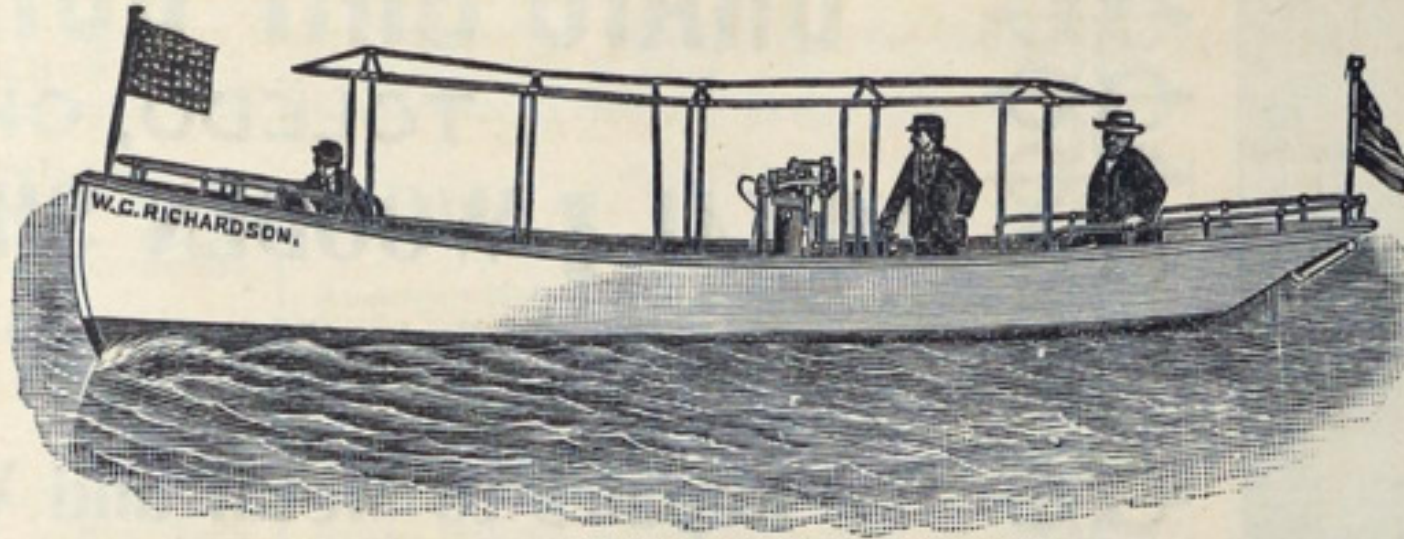


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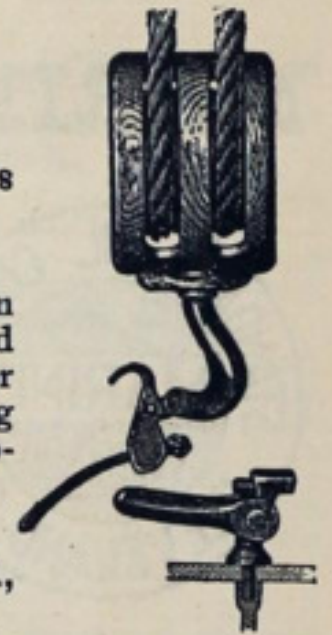


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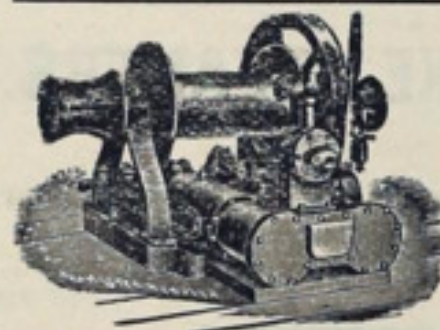
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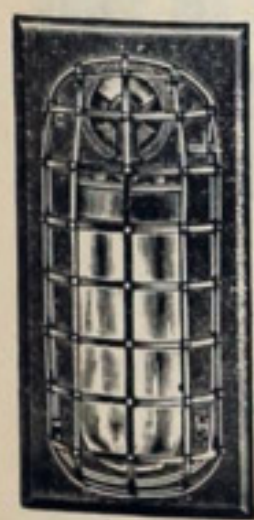
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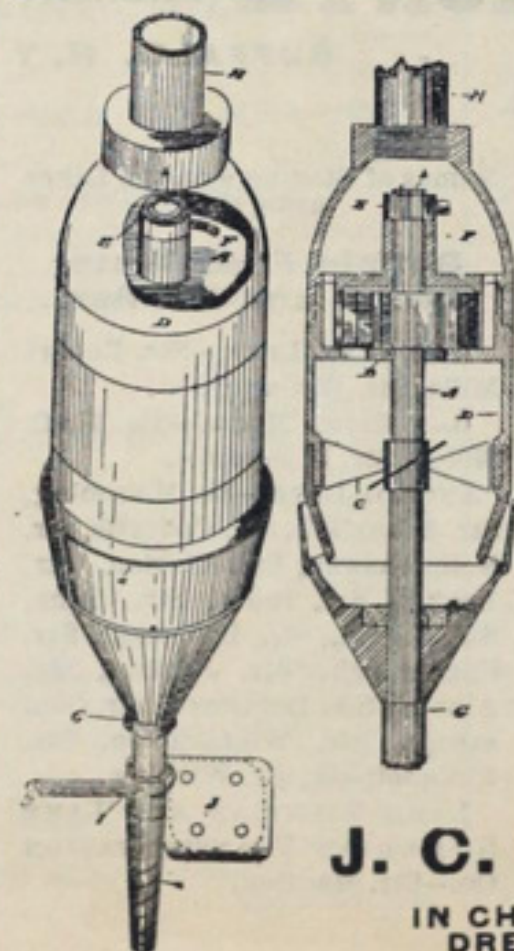
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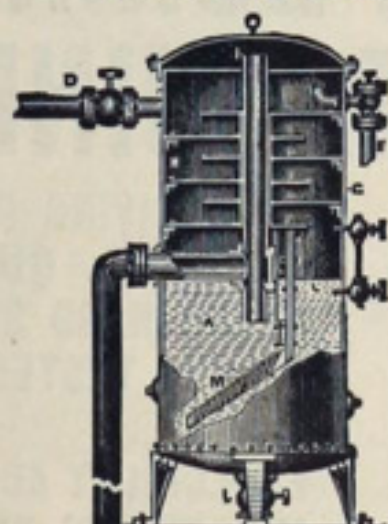
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See accompanying index of advertisers for full addresses of concerns in this directory.

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American Steel Barge Co.	West Superior, Wis.
Craig Ship Building Co.	Toledo, O.
Chicago Ship Building Co.	Chicago.
Detroit Dry Dock Co.	Detroit.
Newport News Ship Building & Dry Dock Co.	Newport News, Va.
Cleveland Ship Building Co.	Cleveland.
Globe Iron Works Co.	Cleveland.
Union Dry Dock Co.	Buffalo.
<b>STOCKLESS ANCHORS.</b>	
Balldt Anchor Co.	Chester, Pa.
International Anchor Co.	Cleveland.
<b>STEERING ENGINES.</b>	
Pawling & Harnischfeger	Milwaukee.
Sheriffs Mfg. Co.	Milwaukee.
Chase Machine Co.	Cleveland.
Globe Iron Works Co.	Cleveland.
Williamson Bros.	Philadelphia.
Queen City Engineering Co.	Buffalo.
Hyde Windlass Co.	Bath, Me.

<b>STEAM HAMMERS, RIVETING MACHINES.</b>	
Bement, Miles & Co.	Philadelphia.
<b>TRAPS, STEAM.</b>	
Wm. S. Haines Co.	Philadelphia.
<b>TOOLS, METAL WORKING, FOR SHIP AND ENGINE WORKS.</b>	
Bement, Miles & Co.	Philadelphia.
Chicago Pneumatic Tool Co.	Chicago.
<b>TOWING COMPANIES.</b>	
Barry Bros. Independent Tug Line	Chicago.
Escanaba Towing & Wrecking Co.	Escanaba, Mich.
The Vessel Owners' Towing Co.	Cleveland.
<b>TUBING, COPPER AND BRASS.</b>	
Randolph & Clowes	Waterbury, Conn.
<b>VALVES.</b>	
Crosby Steam Gauge & Valve Co.	Boston.
Jenkins Bros.	New York.
G. M. Davis Co.	Chicago.
Foster Engineering Co.	Newark, N. J.
<b>VESSEL AND FREIGHT AGENTS.</b>	
Brown & Co.	Buffalo.
J. H. Bartow	Cleveland.
Drake & Maytham	Buffalo.
C. W. Elphicke & Co.	Chicago.
John Gordon & Co.	Buffalo.
Hawgood & Moore	Cleveland.
Hutchinson & Co.	Cleveland.
C. R. Jones & Co.	Cleveland.
Mitchell & Co.	Cleveland.
W. C. Richardson	Cleveland.
<b>WIRE ROPE.</b>	
John A. Roebbling's Sons Co.	New York and Cleveland.
Upson-Walton Co.	Cleveland.
H. H. Baker & Co.	Buffalo.
<b>WHISTLES, STEAM.</b>	
Crosby Steam Gauge & Valve Co.	Boston.
<b>WINDLASSES.</b>	
American Ship Windlass Co.	Providence, R. I.
Hyde Windlass Co.	Bath, Me.
Globe Iron Works Co.	Cleveland.
<b>WRECKING AND SALVAGE COMPANIES.</b>	
Escanaba Towing & Wrecking Co.	Escanaba, Mich.
Donnelly Salvage & Wrecking Co.	Kingston, Ont.
Swain Wrecking Co.	Detroit.
Vessel Owners' Towing Co.	Cleveland.
<b>YACHT BOILERS.</b>	
Detroit Screw Works	Detroit.
<b>YACHT PLUMBERS.</b>	
Alfred B. Sands & Son	New York.
<b>YACHT AND BOAT BUILDERS.</b>	
Thos. Drein & Son	Wilmington, Del.
Gas Engine & Power Co.	New York.
<b>YACHT, BOAT AND CANOE HARDWARE.</b>	
L. W. Ferdinand & Co.	Boston.
<b>YAWLS.</b>	
Thos. Drein & Son	Wilmington, Del.

## Alphabetical List of Marine Review Advertisers.

The star (\*) indicates that the advertisement appears alternate weeks.

Almy Water Tube Boiler Co.	22	Detroit Sheet Metal & Brass Works	19	Kahnweiler, D.	22	Queen City Engineering Co.	22
American Blower Co.	28	Detroit & Cleveland Navigation Co.	27	Katzenstein, L. & Co.	23	Randolph & Clowes	1
American Ship Windlass Co.	2	Dixon, Jos., Crucible Co.	21	Keith, J. G. & Co.	18	Richardson, W. C.	4
American Steel Barge Co.	7	Donnelly Salvage & Wrecking Co.	7	Lackawanna-Green Bay Line	4	Richardson, O. S., Fueling Co.	8
Armstrong Cork Co.	28	Drake & Maytham	4	L. S. & M. S. Ry.	27	Roberts Safety Water Tube Boiler	19
Babcock & Wilcox Co.	7	Drein, Thos. & Son	19	*Lake Carriers' Oil Co.	20	Co.	19
Balldt Anchor Co.	20	Dry Dock Engine Works	3	La Salle & Co.	18	*Roebbling's, John A., Sons Co.	28
Barry Bros. Independent Tug Line	7	Elphicke, C. W. & Co.	4	*Learmonth, Robert	24	Rochester & Pittsburgh Coal & Iron Co.	19
Baker, Howard H. & Co.	21	Eophone Co.	5	Lidgerwood Mfg. Co.	5		
Bartow, J. H.	4	Escanaba Towing & Wrecking Co.	19				
Bement, Miles & Co.	22	Farrar & Trefts	27	McGillis & Co., W. A.	8	Safety Car Heating & Lighting Co.	20
Berlin Iron Bridge Co.	22	Farasey & Marron	23	McKay, James & Co.	18	Sands, Alfred B. & Son	22
Bessemer Steamship Co.	18	Ferdinand, L. W. & Co.	21	McLeod, D.	23	Scott, W. L. Co.	6
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*Bliss, John & Co.	24	Frontier Iron Works	6	Magnolia Metal Co.	1	Ship Owners' Dry Dock Co.	28
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Brown & Co.	18	General Electric Co.	6	Marine Iron Co.	23	Standard Oil Co.	24
Brown & Co.	4	Globe Iron Works Co.	1	Martin-Barriss Co.	21	Standard Brass Works	18
Brown Holsting & Conveying Machine Co.	2	Goulden, Harvey D.	4	Miller, Walter	20	Standard Automatic Releasing Hook Co.	23
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*Chesterton, A. W. & Co.	20	Hanna, M. A. & Co.	19				
*Chadburn & Sons	28	Hanlon, Mark H.	5	Newport News Ship Building & Dry Dock Co.	18	Trout, H. G.	21
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Chicago Pneumatic Tool Co.	20	Hawgood & Moore	4	Northern Steamship Co.	4		
Chicago Ship Building Co.	2	Hayden, P., S. H. Co.	19	Ohio Supply Co.	21	U. S. Metallic Packing Co.	21
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Cleveland & Buffalo Transit Co.	27	Hoyt, Dustin & Kelley	4				
C., C., C. & St. L. Ry.	27	Hutchinson & Co.	4	Page Bros. & Co.	23	Vessel Owners' Towing Co.	27
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*Craig Ship Building Co.	24	International Anchor Co.	21	Peerless Rubber Mfg. Co.	8	Williamson Bros.	20
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Crosby Steam Gauge & Valve Co.	8	Jenkins Brothers	8-22	Pickands, Mather & Co.	21	Wood, W. J.	2
Cuddy-Mullen Coal Co.	6	Johns, H. W. Mfg. Co.	1	Pinney, Orestes C.	4	Worthington, Henry R.	2
Curr, Robert	4	Johnson & Higgins	6	Pittsburgh & Chicago Gas Coal Co.	19		
		Jones, C. R. & Co.	4	Powell, Ambrose V.	4	Youghiogheny River Coal Co.	18
Davis, G. M. & Co.	22			Port Royal Dock Co.	5	Youghiogheny & Lehigh Coal Co.	19
Detroit Dry Dock Co.	1			Porter's, Wm., Sons	19		
Detroit Screw Works	19						



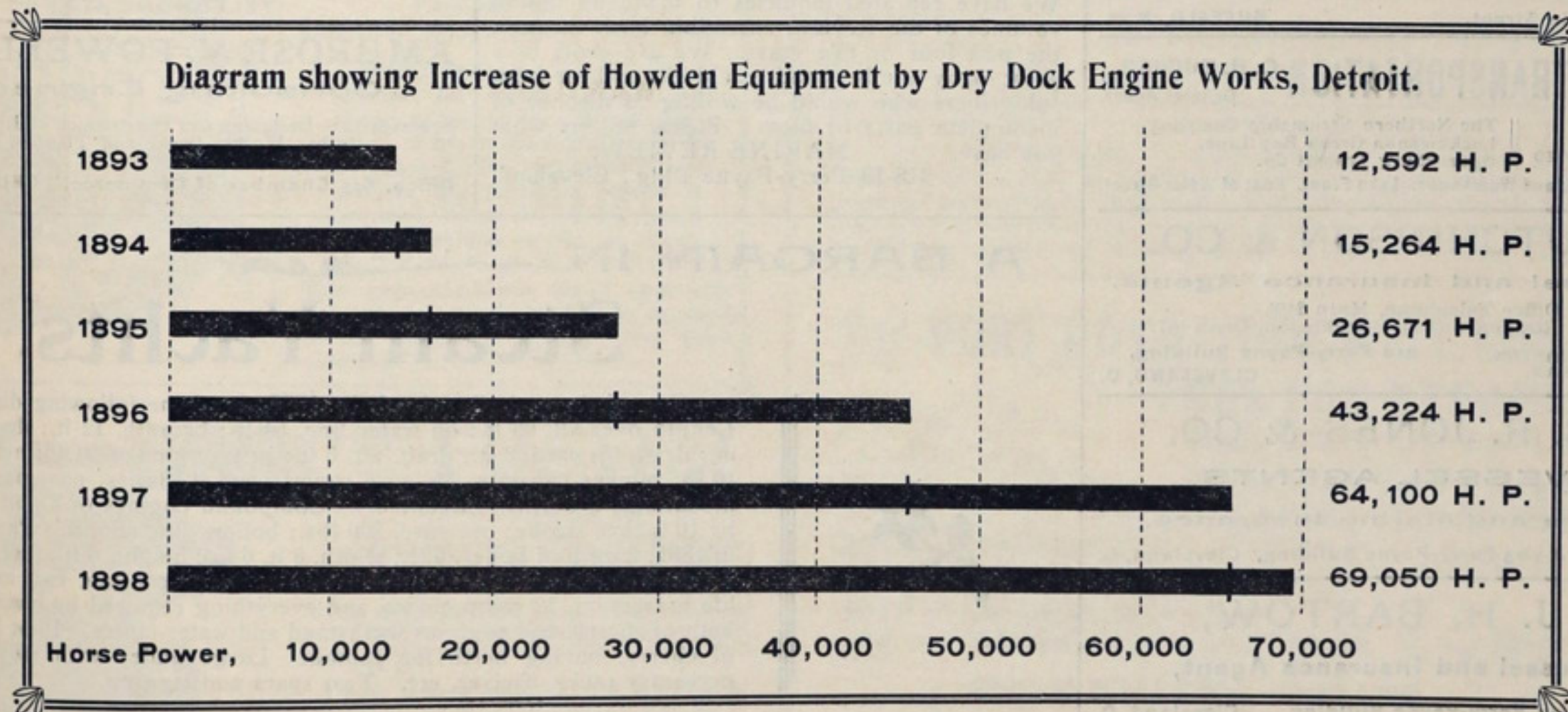
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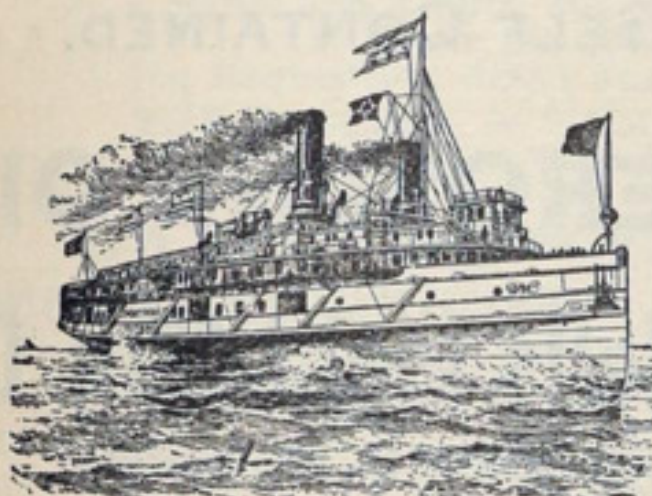
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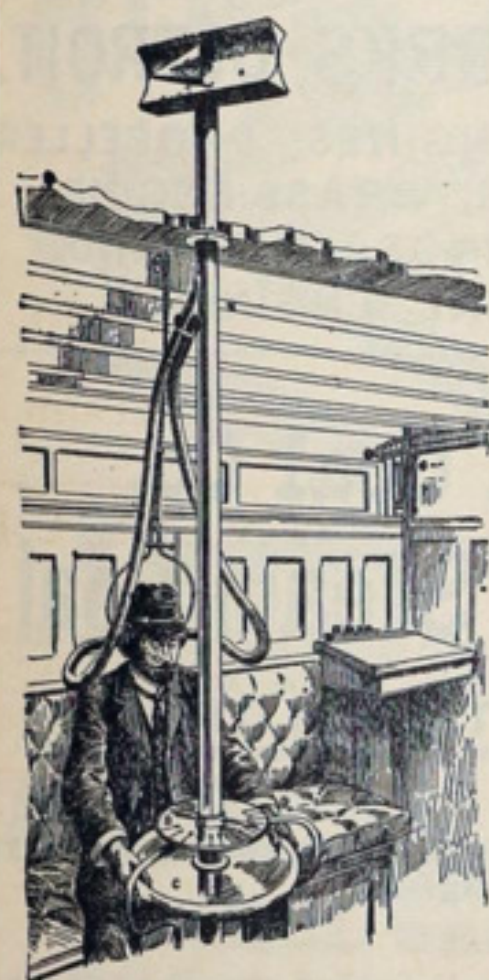
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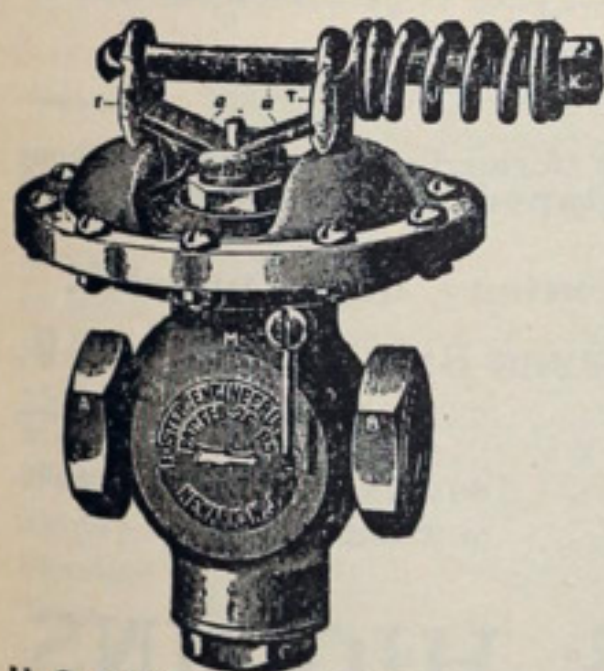
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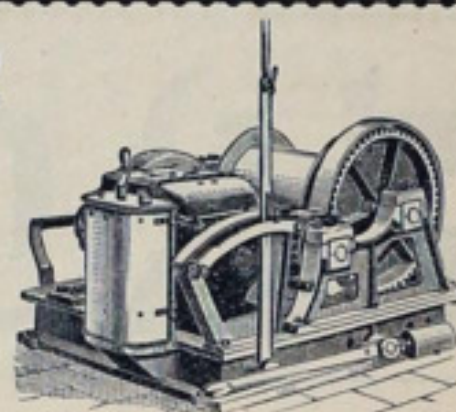
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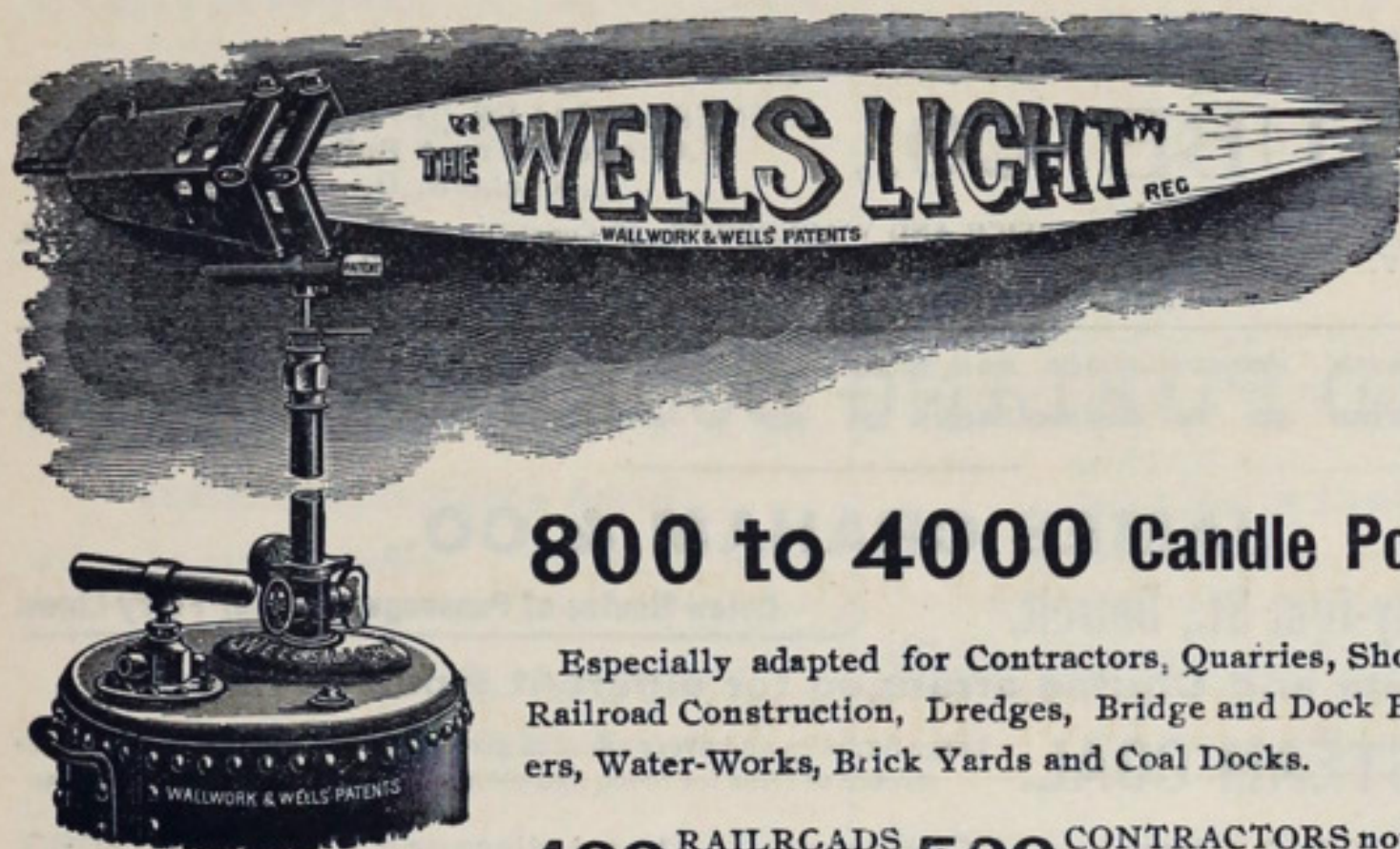
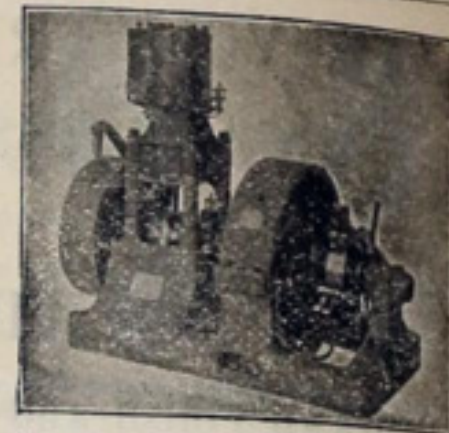
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DETROIT, MICH.

After 20,000 miles of almost continuous steaming since going into commission, including her remarkable trip from San Francisco to Key West, the U. S. Gunboat MARIETTA, equipped with Babcock & Wilcox water tube boilers, ordered the following repair parts:

"T. B. S.—W. D. L.

NAVY DEPARTMENT,  
Bureau of Supplies and Accounts,  
Washington, D. C.

In reply refer to No. 29181.

Gentlemen:

June 10, 1898.

1. Please forward to the Commanding Officer, U. S. S. 'MARIETTA', Key West, Fla., 8 fire bricks, 4 rights and 4 lefts, No. R. 3440, Babcock & Wilcox boilers, to replace broken bricks between furnace doors.
2. Your bill for these articles should be sent to the same officer and should refer to Steam Engineering Requisition dated June 1, 1898.

THE BABCOCK & WILCOX CO.,  
29 Cortlandt St., New York.

Respectfully,

(Sig.) EDWIN STEWART, Paymaster General,  
U. S. N.

On her long voyage the MARIETTA was not detained an instant on account of boilers.

THE BABCOCK & WILCOX CO., WATER TUBE BOILERS, 29 Cortlandt St., New York.

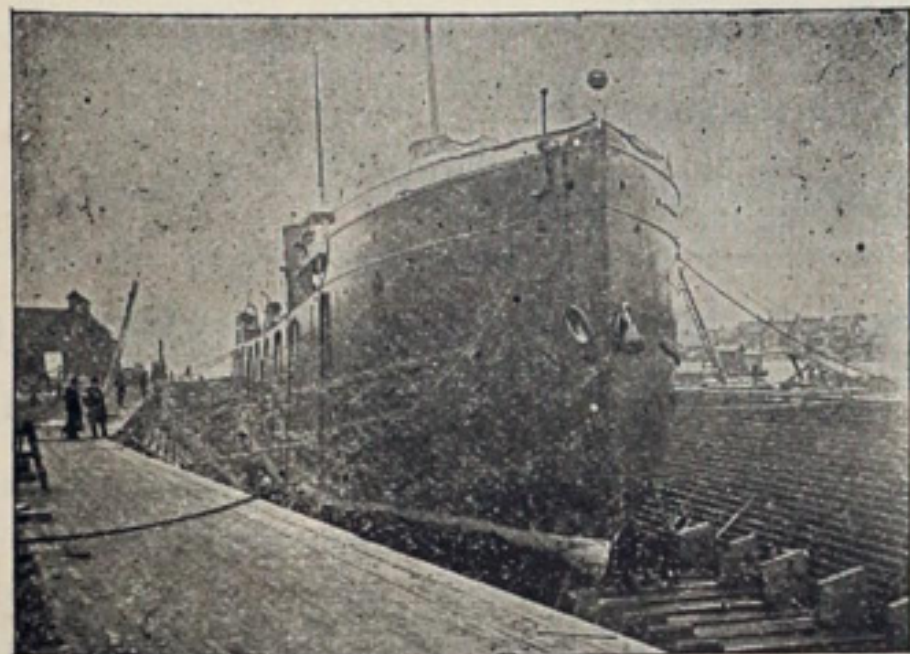


IRON OR STEEL FORGINGS FINISHED COMPLETE, ROUGH MACHINED OR SMOOTH FORGED ONLY, OF ANY WEIGHT. COUPLING LINKS AND PINS. PRESSED WROUGHT IRON TURNBUCKLES. CAR IRON SPECIALTIES.

## AMERICAN STEEL BARGE CO. STEEL and METAL SHIPS

Of all classes built on the Shortest Possible Notice at our yards at  
**West Superior, Wis., and also at Everett, Wash.**

Plates &  
Material  
Always  
on hand  
to Re-  
pair all  
kinds of  
Metal  
Ships in  
Shortest  
Time.



Best  
Quality  
of Oak  
instock  
for Re-  
pairing  
Wooden  
Vessels  
of all  
Classes.

### SIZE OF DOCK.

Length, extreme.....537 feet.	Entrance, Top.....55 feet 9 in
Breadth, Top.....90 " 4 in.	Entrance, Bottom.....50 "
Breadth, Bottom.....52 "	Depth over Sills.....18 "

### LARGEST DRY DOCK ON THE LAKES.

Prices for Repairs and Docking same as at lower lake ports

### SUPERIOR, WIS.

A number of Propeller Wheels in stock at Dry Dock.



## The Equilibrium Circulator and Steam Heating Attachment FOR HEATING AND CIRCULATING THE WATER IN STEAM BOILERS.



Increases evaporation 5% to 15%.

Will pay for itself in a year with saving in repairs.

Keeps all parts of Boiler at an even temperature.

Has no extra Joints to leak.

Creates a constant automatic circulation as long as boiler is fed.

The Steam Heating Attachment will heat and circulate the water with steam from donkey boiler in a half hour, while fires are being started, and be ready for steam with less straining than slow fires burning twelve hours.

**H. BLOOMSBURG & CO.,** 112 35th Street,  
NEWPORT NEWS, VA.

## BARRY BROS. INDEPENDENT TUG LINE, CHICAGO, SO. CHICAGO.

TUGS	RITA McDONALD,	G. A. TOMLINSON,	WM. DICKINSON,	COMMODORE,	TUGS
	CRAWFORD,	D. P. HALL,	IRA D. SMITH,	WELCOME,	
	C. M. CHARNLEY,	PRODIGY,	JAMES A. QUINN,	JACK BARRY.	

CHICAGO OFFICE:  
Telephone 273. 240 South Water St.

SOUTH CHICAGO OFFICE:  
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Tugs G. A. TOMLINSON, D. P. HALL and PRODIGY  
in service at SOUTH CHICAGO at all times.

3 long whistles call our tugs.

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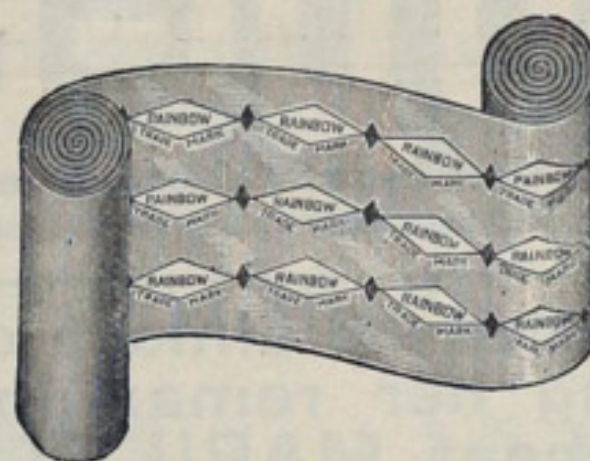


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Thousands of  
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No Equal.  
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Don't have to use wire  
and cloth to hold.

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LOOK OUT FOR IMPOSTERS.

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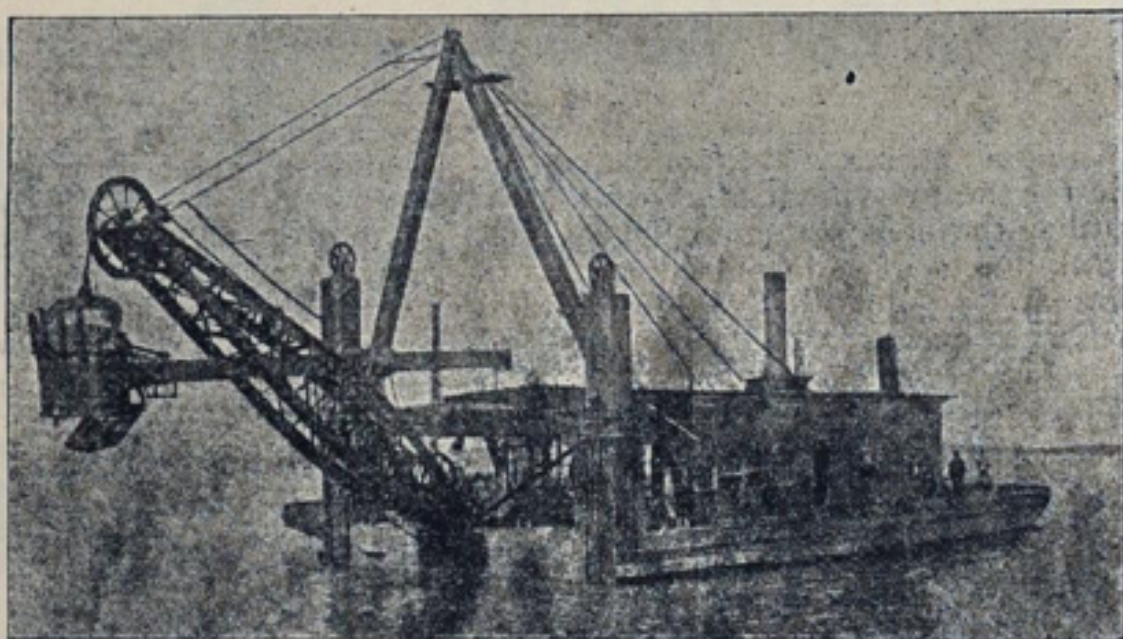
16-24 Woodward Avenue,  
DETROIT, MICH.

16 Warren Street,  
NEW YORK.

202-210 So. Water Street,  
CHICAGO, ILL.

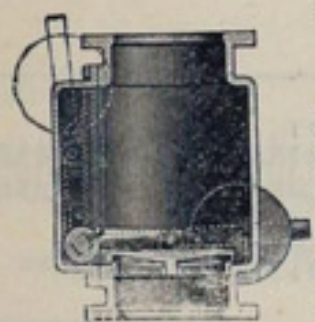
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57 Wade Building,

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### Excelsior Straight-Way Back Pressure Valve.

This valve has no dash pots, springs, guides or complicated levers to get out of order. It is simple, reliable and well-made. Never sticks, and can be relied upon at all times when using exhaust steam for heating; or when used as a relief, or free exhaust on a condensing plant, it has no equal. It is noiseless and free from any complicated attachments.

JENKINS BROTHERS, NEW YORK, PHILADELPHIA, BOSTON, CHICAGO.

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A special opportunity to reduce cost of fees involved in securing a patent of any kind. Address **A. DISCOUNT,**  
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*Stanley B. Smith & Co.*

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OFFICE,  
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## DELTA METAL

REG. TRADE MARKS

Phosphor Bronze

DELTA

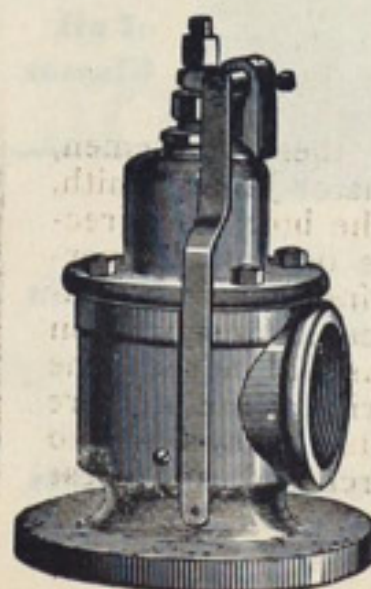
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INGOTS, CASTINGS, WIRE RODS, SHEETS, ETC.  
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**THE HEINTZ STEAM TRAP** wide open when cold—instantly closes after pipes are blown out and live steam enters the trap. The only trap guaranteed to work perfectly on marine work and under every condition, if properly installed.

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## CROSBY STEAM GAGE AND VALVE CO.



CROSBY POP SAFETY VALVES. Locomotive, Marine and Stationery.  
CROSBY WATER RELIEF VALVES, for Pumps, Hydrants, etc.  
CROSBY IMPROVED STEAM PRESSURE GAGES.  
CROSBY STEAM ENGINE INDICATORS, with Sargent's Electrical Attachment for taking any number of Diagrams simultaneously.

The Original SINGLE BELL CHIME WHISTLES.  
BRANDEN PUMP VALVES; rubber with wire-coil insertion.  
BOSWORTH FEED-WATER REGULATOR, PATENT GAGE TESTER, and many other specialties in Steam Lines.

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